K 6

```
FFFFFFFFFFFFFFF     000000000     RRRRRRRRRRRR     RRRRRRRRRRRR     TTTTTTTTTTTTTTT  LLL
FFFFFFFFFFFFFFF     000000000     RRRRRRRRRRRR     RRRRRRRRRRRR     TTTTTTTTTTTTTTT  LLL
FFFFFFFFFFFFFFF     000000000     RRRRRRRRRRRR     RRRRRRRRRRRR     TTTTTTTTTTTTTTT  LLL
FFF              000         000  RRR         RRR  RRR         RRR        TTT        LLL
FFF              000         000  RRR         RRR  RRR         RRR        TTT        LLL
FFF              000         000  RRR         RRR  RRR         RRR        TTT        LLL
FFF              000         000  RRR         RRR  RRR         RRR        TTT        LLL
FFF              000         000  RRR         RRR  RRR         RRR        TTT        LLL
FFF              000         000  RRR         RRR  RRR         RRR        TTT        LLL
FFFFFFFFFFFF     000         000  RRRRRRRRRRRR     RRRRRRRRRRRR           TTT        LLL
FFFFFFFFFFFF     000         000  RRRRRRRRRRRR     RRRRRRRRRRRR           TTT        LLL
FFFFFFFFFFFF     000         000  RRRRRRRRRRRR     RRRRRRRRRRRR           TTT        LLL
FFF              000         000  RRR   RRR        RRR   RRR              TTT        LLL
FFF              000         000  RRR   RRR        RRR   RRR              TTT        LLL
FFF              000         000  RRR   RRR        RRR   RRR              TTT        LLL
FFF              000         000  RRR      RRR     RRR      RRR           TTT        LLL
FFF              000         000  RRR      RRR     RRR      RRR           TTT        LLL
FFF              000         000  RRR      RRR     RRR      RRR           TTT        LLL
FFF                 000000000     RRR         RRR  RRR         RRR        TTT        LLLLLLLLLLLLLLL
FFF                 000000000     RRR         RRR  RRR         RRR        TTT        LLLLLLLLLLLLLLL
FFF                 000000000     RRR         RRR  RRR         RRR        TTT        LLLLLLLLLLLLLLL
```

```
**FILE**ID**FORNMLTAB                                H 14









FFFFFFFFFF    OOOOOO    RRRRRRRR    NN      NN  MM      MM  LL          TTTTTTTTTT    AAAAAA    BBBBBBBB
FFFFFFFFFF    OOOOOO    RRRRRRRR    NN      NN  MM      MM  LL          TTTTTTTTTT    AAAAAA    BBBBBBBB
FF          OO      OO  RR      RR  NN      NN  MMMM  MMMM  LL              TT      AA      AA  BB      BB
FF          OO      OO  RR      RR  NN      NN  MMMM  MMMM  LL              TT      AA      AA  BB      BB
FF          OO      OO  RR      RR  NNNN    NN  MM  MM  MM  LL              TT      AA      AA  BB      BB
FF          OO      OO  RR      RR  NNNN    NN  MM  MM  MM  LL              TT      AA      AA  BB      BB
FFFFFFFF    OO      OO  RRRRRRRR    NN  NN  NN  MM      MM  LL              TT      AA      AA  BBBBBBBB
FFFFFFFF    OO      OO  RRRRRRRR    NN  NN  NN  MM      MM  LL              TT      AA      AA  BBBBBBBB
FF          OO      OO  RR  RR      NN    NNNN  MM      MM  LL              TT      AAAAAAAAAA  BB      BB
FF          OO      OO  RR  RR      NN    NNNN  MM      MM  LL              TT      AAAAAAAAAA  BB      BB
FF          OO      OO  RR    RR    NN      NN  MM      MM  LL              TT      AA      AA  BB      BB      ....
FF          OO      OO  RR    RR    NN      NN  MM      MM  LL              TT      AA      AA  BB      BB      ....
FF            OOOOOO    RR      RR  NN      NN  MM      MM  LLLLLLLLLL      TT      AA      AA  BBBBBBBB        ....
FF            OOOOOO    RR      RR  NN      NN  MM      MM  LLLLLLLLLL      TT      AA      AA  BBBBBBBB        ....

LL            IIIIII      SSSSSSSS
LL            IIIIII      SSSSSSSS
LL              II      SS
LL              II      SS
LL              II      SS
LL              II      SS
LL              II        SSSSSS
LL              II        SSSSSS
LL              II              SS
LL              II              SS
LL              II              SS
LL              II              SS
LLLLLLLLLL    IIIIII    SSSSSSSS
LLLLLLLLLL    IIIIII    SSSSSSSS
```

FO
1-

```
0 MODULE FOR$$NML_TABLES (%TITLE 'FOR$$NML_TABLES - TPARSE state tables for NAMELIST input'
0                 IDENT = '1-012'          ! File: FORNMLTAB.B32 Edit: SBL1012
0                 ) =
1 BEGIN
1 !
1 !****************************************************************************
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1 !*                                                                          *
1 !****************************************************************************
1 !
1
1 !++
1 ! FACILITY:      FORTRAN Language Support
1 !
1 ! ABSTRACT:
1 !
1 !      This module contains the LIB$TPARSE state tables used in
1 !      implementing FORTRAN NAMELIST input.  It also contains the
1 !      action routines associated with the state tables.
1 !
1 ! ENVIRONMENT:  User mode - AST reentrant
1 !
1 ! AUTHOR: Steven B. Lionel, CREATION DATE: 10-July-1980
1 !
1 ! MODIFIED BY:
1 !
1 ! 1-001 - Original.  SBL 10-July-1980
1 ! 1-002 - Disallow superfluous commas.  SBL 18-Nov-1980
1 ! 1-003 - Reflect change in group block spec so that number-of-variables is
1 !         a word; second word is reserved.  SBL 5-Dec-1980
1 ! 1-004 - Don't require a delimiter before ending $ or &.  These characters can
1 !         no longer be a part of a logical constant.  SBL 17-Dec-1980
1 ! 1-005 - Allow repeated nulls of the form "r*".  Don't consider repeated values
1 !         as candidates for being identifiers.  Add comments.  SBL 2-Mar-1981
1 ! 1-006 - Add text describing the NAMELIST descriptor block.  Disallow an array
1 !         substring without a subscript.  SBL 15-April-1981
1 ! 1-007 - Change to use new OTS$CVT_T_F routine.  SBL 15-April-1981
1 ! 1-008 - Also use OTS$CVT_T_F in STORE_COMPLEX.  SBL 5-June-1981
1 ! 1-009 - Use new ONE_OF macro where necessary.  SBL 18-Dec-1981
```

```
1 ! **** Start post-V3.0 enhancements. ****
1 ! 1-010 - Enhancements and minor bug fixes:  SBL 17-Dec-1982
1 !             1. Allow "!" to begin an end-of-line comment.  It is allowed
1 !                wherever "end-of-line" is allowed, except in character values,
1 !                and is equivalent to end-of-line.
1 !             2. Disallow signed integer as syntactically correct for
1 !                repeat count.
1 !             3. Improve error reporting by chaining FOR$_INVTEXREC for
1 !                input conversion errors.
1 !             4. Use prologue file.
1 ! 1-011 - Turn off NML$V_IMAG in STORE_VALUE so that subsequent complex values
1 !         get stored correctly.  (Same as BUG 1-009A)  SPR 11-nnnnn SBL 7-Mar-1983
1 ! 1-012 - Add inquiry feature.  SBL 24-May-1983
1 !--
1
```

```
1 %SBTTL 'Declarations'
1 !
1 ! PROLOGUE FILE:
1 !
1
1 REQUIRE 'RTLIN:FORPROLOG';                            ! FORTRAN-specific declarations
1
1 !
1 ! LINKAGES:
1 !
1
1 LINKAGE
1     JSB_COMPARE_UPCASE = JSB (REGISTER=4, REGISTER=5) :
1                          NOPRESERVE (0,1,2,3,4) NOTUSED (6,7,8,9,10,11);
1
1 !
1 ! TABLE OF CONTENTS:
1 !
1
1 FORWARD ROUTINE
1     NEXT_RECORD,                              ! Read another record
1     LOOKUP_IDENTIFIER,                        ! Lookup identifier
1     SUBSTRING_COLON,                          ! Process colon in substring
1     INIT_SUBS,                                ! Start a subscript/substring
1     STORE_SUBS,                               ! Store a subscript/substring
1     END_SUBSCRIPT,                            ! End a subscript
1     END_SUBSTRING,                            ! End a substring
1     CONVERT_INTEGER,                          ! Convert a decimal integer
1     STORE_LOGICAL,                            ! Store a logical into CONSBLOCK
1     STORE_REAL,                               ! Store a real value into CONSBLOCK
1     STORE_COMPLEX,                            ! Store a complex value into CONSBLOCK
1     STORE_REPEAT,                             ! Store repeat count
1     END_REPEAT,                               ! End a repeated value
1     STORE_CHARACTER,                          ! Store a character string character
1     END_CHARACTER,                            ! End a character string
1     STRING_OK,                                ! Is a string value ok?
1     STORE_VALUE,                              ! Store a value
1     NULL_VALUE,                               ! Skip an element
1     SET_VALUE_IDENT,                          ! Indicate last value was an identifier
1     WAS_VALUE_IDENT,                          ! Lookup last value token as an identifier
1     SYNTAX_ERROR,                             ! Signal a syntax error
1     INVREFVAR_ERROR,                          ! Signal invalid ref to variable error
1     INPCONERR_ERROR,                          ! Signal input conversion error
1     BLANKS_OFF,                               ! Turn explicit blanks off
1     BLANKS_ON,                                ! Turn explicit blanks on
1     COMPUTE_INDEX,                            ! Compute the subscript index
1     COMPARE_UPCASE: JSB_COMPARE_UPCASE,       ! Compare strings upcased
1     DUMP_NAMES,                               ! Respond to '?' inquiry
1     DUMP_VALUES;                              ! Respond to '=?' inquiry
1
1 !
1 ! REQUIRE FILES:
1 !
1
1 LIBRARY 'RTLTPAMAC';                                  ! TPARSE library of macros
1
1 !
```

```
1 ! EQUATED SYMBOLS:
1 !
1
1 LITERAL
1     SINGLE_QUOTE = 39,                            ! ASCII value for "'"
1     K_NULL = 0,                                   ! Constant type for null value
1     K_LOGICAL = 1,                                ! Constant type for logical
1     K_INTEGER = 2,                                ! Constant type for integer
1     K_REAL = 3,                                   ! Constant type for real
1     K_COMPLEX = 4,                                ! Constant type for complex
1     K_CHARACTER = 5;                              ! Constant type for character
1
1 !
1 ! FIELDS:
1 !
1 !       NONE
1 !
1 ! OWN STORAGE:
1 !
1 !       NONE
1 !
1 ! BUILTIN DECLARATIONS:
1 !
1 BUILTIN
1     CALLG,
1     INDEX;
1
1 !
1 ! EXTERNAL REFERENCES:
1 !
1
1 EXTERNAL ROUTINE
1     FOR$$CVT_TYPE,                         ! Convert a value to destination type
1     FOR$$DO_NML_OUTPUT: CALL_CCB,          ! Do Namelist output
1     FOR$$REC_RSNO: JSB_RECO,               ! Read a record
1     FOR$$REC_WSNO: JSB_RECO,               ! Start a write
1     FOR$$SIGNAL: NOVALUE,                  ! Signal continuable error
1     FOR$$SIGNAL_STO: NOVALUE,              ! Signal fatal error
1     OTS$CVT_TI_L,                          ! Convert decimal to longword
1     OTS$CVT_TL_L,                          ! Convert logical to longword
1     OTS$CVT_T_F,                           ! Convert text to F_floating
1     OTS$CVT_T_D,                           ! Convert text to D_floating
1     OTS$CVT_T_G,                           ! Convert text to G_floating
1     OTS$CVT_T_H,                           ! Convert text to H_floating
1     LIB$SIG_TO_RET;                        ! Convert signal to return value
1
1 !<BLF/PAGE>
```

```
; 179       0242  1 !++
; 180       0243  1 !   Each NAMELIST descriptor block has the following form:
; 181       0244  1 !
; 182       0245  1 !           3 3 2 2 2 2 2 2 2 2 2 2 1 1 1 1 1 1 1 1 1 1
; 183       0246  1 !           1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 0
; 184       0247  1 !
; 185       0248  1 !          +---------------------------------------------------------------+
; 186       0249  1 !        0 |           Address of ASCIC name of NAMELIST group              |
; 187       0250  1 !          +---------------------------------------------------------------+
; 188       0251  1 !        1 |          Reserved            |  Count of NAMELIST variables   |
; 189       0252  1 !          +---------------------------------------------------------------+
; 190       0253  1 !        2 |             Address of ASCIC name of variable 1                |
; 191       0254  1 !          +---------------------------------------------------------------+
; 192       0255  1 !        3 |      Address of standard VAX descriptor for variable 1         |
; 193       0256  1 !          +---------------------------------------------------------------+
; 194       0257  1 !        4 |                             ...                                |
; 195       0258  1 !          +---------------------------------------------------------------+
; 196       0259  1 !        5 |             Address of ASCIC name of variable n                |
; 197       0260  1 !          +---------------------------------------------------------------+
; 198       0261  1 !        6 |      Address of standard VAX descriptor for variable n         |
; 199       0262  1 !          +---------------------------------------------------------------+
; 200       0263  1 !
; 201       0264  1 !
; 202       0265  1 !   The NAMELIST group name and the variable names which are pointed to in
; 203       0266  1 !   the  NAMELIST  descriptor  block  are  upper  case  only.  The FORTRAN
; 204       0267  1 !   compiler or other calling program is responsible for  case  conversion
; 205       0268  1 !   of the name strings.  In NAMELIST input data, case is significant only
; 206       0269  1 !   in character literals.  The run-time library is responsible  for  case
; 207       0270  1 !   conversion of NAMELIST input data.
; 208       0271  1 !
; 209       0272  1 !   The allowable data types in variable descriptors are  BU  (BYTE),  WU,
; 210       0273  1 !   LU,  W,  L,  F,  D, G, H, T, FC, DC, and GC.  The allowable descriptor
; 211       0274  1 !   classes are scalar and array.  For the  array  class  descriptor,  the
; 212       0275  1 !   descriptor  flags  COLUMN,  COEFF,  and BOUNDS must be set, indicating
; 213       0276  1 !   column-major order and the presence of coefficient and bounds  blocks.
; 214       0277  1 !   The number of dimensions must not exceed 7.
; 215       0278  1 !--
; 216       0279  1
; 217       0280  1 !<BLF/PAGE>
;  219          0281  1 %SBTTL 'FOR$$NML_TABLES - TPARSE tables for NAMELIST input'
;  220          0282  1
;  221          0283  1 !++
;  222          0284  1 ! FUNCTIONAL DESCRIPTION:
;  223          0285  1 !
;  224          0286  1 !       The following are the state tables used to perform FORTRAN
;  225          0287  1 !       NAMELIST input.
;  226          0288  1 !
;  227          0289  1 !--
;  228          0290  1
;  229          0291  1 $INIT_STATE (FOR$$A_NMLSTATE, FOR$$A_NMLKEYWD);
;  230          0292  1
;  231          0293  1 !+
;  232          0294  1 ! Main scanning loop.  Look for assignments.
;  233          0295  1 ! If a $ or & is found, terminate the statement.
;  234          0296  1 !-
;  235        P 0297  1 $STATE (BEGIN_SCAN,
;  236        P 0298  1     ((END_OF_LINE), BEGIN_SCAN, NEXT_RECORD),
;  237        P 0299  1     ('$', TPA$_EXIT),
;  238        P 0300  1     ('&', TPA$_EXIT),
;  239        P 0301  1     ((ASSIGNMENT), BEGIN_SCAN, BLANKS_OFF),
;  240        P 0302  1     (TPA$_LAMBDA, ERROR_STATE)
;  241          0303  1     );
;  242          0304  1
;  243          0305  1 !+
;  244          0306  1 ! This state matches the equivalent of an end-of-line; either the
;  245          0307  1 ! actual end-of-line or a comment beginning with "!", but it does
;  246          0308  1 ! not consume the "!".
;  247          0309  1 !-
;  248        P 0310  1 $STATE (END_OF_LINE,
;  249        P 0311  1     (TPA$_EOS, TPA$_EXIT),
;  250        P 0312  1     ((NO_COMMENT), TPA$_FAIL),
;  251        P 0313  1     (TPA$_LAMBDA, TPA$_EXIT)
;  252          0314  1     );
;  253          0315  1
;  254          0316  1 !+
;  255          0317  1 ! An assignment consists of a variable, an equals sign, and a list of values.
;  256          0318  1 !-
;  257        P 0319  1 $STATE (ASSIGNMENT,
;  258        P 0320  1     ((VARIABLE), ASSN_EQL ,BLANKS_OFF),
;  259        P 0321  1     ('?', FLUSH_RECORD, DUMP_NAMES),                ! Dump names
;  260        P 0322  1     ((EQUALS_QUESTION), FLUSH_RECORD, DUMP_VALUES), ! Dump values and retry
;  261        P 0323  1     (TPA$_LAMBDA, ERROR_STATE)
;  262          0324  1     );
;  263          0325  1
;  264        P 0326  1 $STATE (FLUSH_RECORD,
;  265        P 0327  1     (TPA$_EOS, TPA$_EXIT),
;  266        P 0328  1     (TPA$_ANY, FLUSH_RECORD)
;  267          0329  1     );
;  268          0330  1
;  269        P 0331  1 $STATE (ASSN_EQL,
;  270        P 0332  1     ((END_OF_LINE), ASSN_EQL, NEXT_RECORD),
;  271        P 0333  1     ('=', VALUE_LIST),
;  272        P 0334  1     (TPA$_LAMBDA, ERROR_STATE)
;  273          0335  1     );
;  274          0336  1
;  275          0337  1 !+
! A value list consists of simple values and repeated values, possibly separated
! by commas.  A comma instead of a value indicates an omitted value, where that
! element of the variable should remain unchanged.
!-
$STATE (VALUE_LIST,
    ((END_OF_LINE), VALUE_LIST, NEXT_RECORD),
    (',', VALUE_LIST, NULL_VALUE),
    ((REPEATED_VALUE), VALUE_LIST1, BLANKS_ON),
    ((VALUE), VALUE_LIST1, BLANKS_ON),
    (TPA$_LAMBDA, TPA$_EXIT)
    );

!+
! A value has been found.  The next delimiter tells us if that token was really
! a value or was an identifier that looked like a value.
!-
$STATE (VALUE_LIST1,
    ((END_OF_LINE), VALUE_LIST2, BLANKS_OFF),
    (TPA$_BLANK, VALUE_LIST2, BLANKS_OFF),
    ((NO_LPAREN), VALUE_LIST2, BLANKS_OFF),      ! Succeeds if "(" NOT found
    (TPA$_LAMBDA, TPA$_EXIT, SET_VALUE_IDENT)    ! Last token was an identifier
    );

!+
! At this point, the last token was an identifier only if the next significant
! character is an "=".  The other case, a "(", was taken care of in the
! previous state.
!-
$STATE (VALUE_LIST2,
    ((END_OF_LINE), VALUE_LIST2, NEXT_RECORD),
    (TPA$_BLANK, VALUE_LIST2),                   ! Even though explicit blank
                                                 ! processing is off, use up
                                                 ! blanks in the record to aid
                                                 ! error reporting.
    (',', VALUE_LIST, STORE_VALUE),
    ((NO_EQUALS), VALUE_LIST, STORE_VALUE),      ! Succeeds if "=" NOT found
    (TPA$_LAMBDA, TPA$_EXIT, SET_VALUE_IDENT)    ! Last token was an identifier
    );

!+
! This type of state determines if the next character is "(", without consuming
! the character.  In this case, failure indicates that the desired character
! was found.  This scheme is used in the next, and in other states.
!-
$STATE (NO_LPAREN,
    ('(', TPA$_FAIL),
    (TPA$_LAMBDA, TPA$_EXIT)
    );

$STATE (NO_EQUALS,
    ((NO_EQUALS_QUESTION), NO_EQUALS2),
    (TPA$_LAMBDA, TPA$_EXIT)
    );

$STATE (NO_EQUALS2,
    ('=', TPA$_FAIL),
    (TPA$_LAMBDA, TPA$_EXIT)
;        1      );
;        1
;      P 1  $STATE (NO_EQUALS_QUESTION,
;      P 1      ((EQUAL$_QUESTION), TPA$_FAIL),
;      P 1      (TPA$_LAMBDA, TPA$_EXIT)
;        1      );
;        1
;        1  !+
;        1  ! Look for '=?'
;        1  !-
;      P 1  $STATE (EQUALS_QUESTION,
;      P 1      ('=', , BLANKS_ON)                      ! Does it start with '='?
;        1      );
;        1
;      P 1  $STATE (,
;      P 1      ('?', TPA$_EXIT, BLANKS_OFF),          ! '=?' found
;      P 1      (TPA$_LAMBDA, TPA$_FAIL, BLANKS_OFF)
;        1      );
;        1
;      P 1  $STATE (NO_COMMENT,
;      P 1      ('!', TPA$_FAIL),
;      P 1      (TPA$_LAMBDA, TPA$_EXIT)
;        1      );
;        1
;        1  !+
;        1  ! A repeated value is of the form n*value, where n is an unsigned integer and
;        1  ! no delimiters appear on either side of the "*".  A repeated null is of the
;        1  ! form "n*" where a delimiter follows the "*".
;        1  !-
;        1
;      P 1  $STATE (REPEATED_VALUE,
;      P 1      (TPA$_DECIMAL, REPEAT2, BLANKS_ON)  ! Value stored in TPA$L_NUMBER
;        1      );
;        1
;      P 1  $STATE (REPEAT2,
;      P 1      ('*', REPEAT3, STORE_REPEAT),
;      P 1      (TPA$_LAMBDA, TPA$_FAIL, BLANKS_OFF)
;        1      );
;        1
;      P 1  $STATE (REPEAT3,
;      P 1      ((VALUE), TPA$_EXIT, END_REPEAT),     ! n*c
;      P 1      ((NOT_DELIM), ERROR_STATE),           ! Not n*
;      P 1      (TPA$_LAMBDA, TPA$_EXIT, BLANKS_OFF)! Is "n*", skipping will be done by STORE_VALUE
;        1      );
;        1
;        1  !+
;        1  ! A value can be one of four types.  Integers look like reals, for our purposes.
;        1  ! This state can fail if the current string isn't matched by any of these patterns.
;        1  !-
;      P 1  $STATE (VALUE,
;      P 1      ((LOGICAL), TPA$_EXIT, STORE_LOGICAL),
;      P 1      ((REAL), TPA$_EXIT, STORE_REAL),
;      P 1      ((COMPLEX), TPA$_EXIT),        ! Stores are done for each part
;      P 1      ((CHARACTER), TPA$_EXIT, END_CHARACTER)
;        1      );
;        1
;        1
;  390          0452  1  !+
;  391          0453  1  ! A variable consists of an identifier, followed by an optional subscript,
;  392          0454  1  ! followed by an optional substring.  If, while parsing values for the previous
;  393          0455  1  ! assignment, it was determined that the last "value" was really an identifier,
;  394          0456  1  ! WAS_VALUE_IDENT will retrieve the token from NML$T_TOKEN and call LOOKUP_IDENTIFIER
;  395          0457  1  ! itself.  Otherwise, we look for an identifier here.
;  396          0458  1  !-
;  397          0459  1
;  398        P 0460  1  $STATE (VARIABLE,
;  399        P 0461  1      (TPA$_LAMBDA, VARIABLE2, WAS_VALUE_IDENT),  ! Fails if last token was not
;  400        P 0462  1                                                  ! an identifier.  If it succeeds,
;  401        P 0463  1                                                  ! lookup is done.
;  402        P 0464  1      ((IDENTIFIER), VARIABLE2, LOOKUP_IDENTIFIER),
;  403          0465  1      );
;  404          0466  1
;  405        P 0467  1  $STATE (VARIABLE2,
;  406        P 0468  1      (TPA$_LAMBDA, , BLANKS_ON)
;  407          0469  1      );
;  408          0470  1
;  409          0471  1  !+
;  410          0472  1  ! Look for subscript or substring.
;  411          0473  1  !-
;  412        P 0474  1  $STATE (SUBSCRIPT_START,
;  413        P 0475  1      ('(', SUB_LOOP1, INIT_SUBS),        ! Signals error if subscript/substring not ok
;  414        P 0476  1      (TPA$_LAMBDA, TPA$_EXIT)
;  415          0477  1      );
;  416          0478  1
;  417          0479  1  !+
;  418          0480  1  ! Get first subscript or first substring.  We can't tell which is which until
;  419          0481  1  ! we see the ":".
;  420          0482  1  !-
;  421        P 0483  1  $STATE (SUB_LOOP1,
;  422        P 0484  1      ((END_OF_LINE), SUB_LOOP1, NEXT_RECORD),
;  423        P 0485  1      (TPA$_BLANK, SUB_LOOP1),
;  424        P 0486  1      ((DECIMAL_INTEGER), , STORE_SUBS),
;  425        P 0487  1      (':', RIGHT_SUBSTRING, SUBSTRING_COLON),      ! Succeeds if substring ok
;  426        P 0488  1                                                    ! otherwise signals FOR$_INVREFVAR
;  427        P 0489  1      (TPA$_LAMBDA, INVREFVAR_STATE)                ! Signal FOR$_INVREFVAR
;  428          0490  1      );
;  429          0491  1
;  430          0492  1  !+
;  431          0493  1  ! This state and the next one consist of the loop looking for subscripts.
;  432          0494  1  ! if a colon is found, control transfers to the substring processor.
;  433          0495  1  !-
;  434        P 0496  1  $STATE (SUB_LOOP2,
;  435        P 0497  1      ((END_OF_LINE), SUB_LOOP2, NEXT_RECORD),
;  436        P 0498  1      (TPA$_BLANK, SUB_LOOP2),
;  437        P 0499  1      (',', SUB_LOOP3),
;  438        P 0500  1      (':', RIGHT_SUBSTRING, SUBSTRING_COLON),      ! Succeeds if substring ok
;  439        P 0501  1                                                    ! otherwise signals FOR$_INVREFVAR
;  440        P 0502  1      (')', START_SUBSTRING, END_SUBSCRIPT),
;  441        P 0503  1      (TPA$_LAMBDA, ERROR_STATE)
;  442          0504  1      );
;  443          0505  1
;  444        P 0506  1  $STATE (SUB_LOOP3,
;  445        P 0507  1      ((END_OF_LINE), SUB_LOOP3, NEXT_RECORD),
;  446        P 0508  1      (TPA$_BLANK, SUB_LOOP3),
    ((DECIMAL_INTEGER), SUB_LOOP2, STORE_SUBS),
    (TPA$_LAMBDA, INVREFVAR_STATE)                      ! Signal FOR$_INVREFVAR
    );

!+
! This state is reached if we have already processed a subscript.  At this point,
! only a substring is allowed.
!-
$STATE (START_SUBSTRING,
    ('(', , INIT_SUBS),
    (TPA$_LAMBDA, TPA$_EXIT)
    );

$STATE (LEFT_SUBSTRING,
    ((END_OF_LINE), LEFT_SUBSTRING, NEXT_RECORD),
    (TPA$_BLANK, LEFT_SUBSTRING),
    ((DECIMAL_INTEGER), SUBSTRING2, STORE_SUBS),
    (':', RIGHT_SUBSTRING, SUBSTRING_COLON),
    (TPA$_LAMBDA, INVREFVAR_STATE)                      ! Signal FOR$_INVREFVAR
    );

$STATE (SUBSTRING2,
    ((END_OF_LINE), SUBSTRING2, NEXT_RECORD),
    (TPA$_BLANK, SUBSTRING2),
    (':', RIGHT_SUBSTRING, SUBSTRING_COLON),
    (TPA$_LAMBDA, ERROR_STATE)
    );

$STATE (RIGHT_SUBSTRING,
    ((END_OF_LINE), RIGHT_SUBSTRING, NEXT_RECORD),
    (TPA$_BLANK, RIGHT_SUBSTRING),
    ((DECIMAL_INTEGER), SUBSTRING3, STORE_SUBS),
    (')', TPA$_EXIT, END_SUBSTRING),
    (TPA$_LAMBDA, INVREFVAR_STATE)                      ! Signal FOR$_INVREFVAR
    );

$STATE (SUBSTRING3,
    ((END_OF_LINE), SUBSTRING3, NEXT_RECORD),
    (TPA$_BLANK, SUBSTRING3),
    (')', TPA$_EXIT, END_SUBSTRING),
    (TPA$_LAMBDA, ERROR_STATE)
    );

!+
! An identifier is a letter followed by 0 or more letters, digits, "$" or "_".
!-
$STATE (IDENTIFIER,
    (TPA$_ALPHA, , BLANKS_ON)
    );

$STATE (,
    (TPA$_SYMBOL, TPA$_EXIT, BLANKS_OFF),            ! Matches any string whose characters
                                                     ! consist of letters, digits,
                                                     ! "$" and "_".
    (TPA$_LAMBDA, TPA$_EXIT, BLANKS_OFF),
    );

```

```
;  504         P 0566  1 $STATE (DECIMAL_INTEGER,
;  505         P 0567  1     ((INTEGER), TPA$_EXIT, CONVERT_INTEGER)
;  506           0568  1     );
;  507           0569  1
;  508         P 0570  1 $STATE (INTEGER,
;  509         P 0571  1     ('+', , BLANKS_ON),
;  510         P 0572  1     ('-', , BLANKS_ON),
;  511         P 0573  1     (TPA$_LAMBDA, , BLANKS_ON)
;  512           0574  1     );
;  513           0575  1
;  514         P 0576  1 $STATE (,
;  515         P 0577  1     (TPA$_DECIMAL, TPA$_EXIT, BLANKS_OFF),
;  516         P 0578  1     (TPA$_LAMBDA, TPA$_FAIL, BLANKS_OFF)
;  517           0579  1     );
;  518           0580  1
;  519           0581  1 !+
;  520           0582  1 ! Pattern for a REAL value.
;  521           0583  1 !-
;  522         P 0584  1 $STATE (REAL,
;  523         P 0585  1     ('+', , BLANKS_ON),
;  524         P 0586  1     ('-', , BLANKS_ON),
;  525         P 0587  1     (TPA$_LAMBDA, , BLANKS_ON)
;  526           0588  1     );
;  527           0589  1
;  528         P 0590  1 $STATE (REAL1,
;  529         P 0591  1     (TPA$_DIGIT, REAL1),
;  530         P 0592  1     ('.'),
;  531         P 0593  1     (TPA$_LAMBDA)
;  532           0594  1     );
;  533           0595  1
;  534         P 0596  1 $STATE (REAL2,
;  535         P 0597  1     (TPA$_DIGIT, REAL2),
;  536         P 0598  1     (TPA$_LAMBDA)
;  537           0599  1     );
;  538           0600  1
;  539         P 0601  1 $STATE (EXPONENT,
;  540         P 0602  1     ('E'),
;  541         P 0603  1     ('e'),
;  542         P 0604  1     ('D'),
;  543         P 0605  1     ('d'),
;  544         P 0606  1     ('Q'),
;  545         P 0607  1     ('q'),
;  546         P 0608  1     (TPA$_LAMBDA)
;  547           0609  1     );
;  548           0610  1
;  549         P 0611  1 $STATE (,
;  550         P 0612  1     ('+'),
;  551         P 0613  1     ('-'),
;  552         P 0614  1     (TPA$_LAMBDA)
;  553           0615  1     );
;  554           0616  1
;  555         P 0617  1 $STATE (EXPONENT2,
;  556         P 0618  1     (TPA$_DIGIT, EXPONENT2),
;  557         P 0619  1     (TPA$_LAMBDA)
;  558           0620  1     );
;  559           0621  1
;  560         P 0622  1 $STATE (,                         ! Fail if next character is not a delimiter
;  561         P 0623  1       ((NOT_DELIM), TPA$_FAIL),    ! but don't consume the character.
;  562         P 0624  1       (TPA$_LAMBDA, TPA$_EXIT)
;  563           0625  1       );
;  564           0626  1
;  565         P 0627  1 $STATE (NOT_DELIM,                 ! Fails if next character is a delimiter
;  566         P 0628  1       ((END_OF_LINE), TPA$_FAIL),
;  567         P 0629  1       (TPA$_BLANK, TPA$_FAIL),
;  568         P 0630  1       (',', TPA$_FAIL),
;  569         P 0631  1       ('$', TPA$_FAIL),
;  570         P 0632  1       ('&', TPA$_FAIL),
;  571         P 0633  1       (')', TPA$_FAIL),            ! Can show in complex values
;  572         P 0634  1       (TPA$_LAMBDA, TPA$_EXIT)
;  573           0635  1       );
;  574           0636  1
;  575           0637  1 !+
;  576           0638  1 ! Pattern for a logical value.  It is complex because any string can follow
;  577           0639  1 ! after the initial T, F, .T or .F up to the next "delimiter".
;  578           0640  1 !-
;  579         P 0641  1 $STATE (LOGICAL,
;  580         P 0642  1       ('.', , BLANKS_ON),
;  581         P 0643  1       (TPA$_LAMBDA, , BLANKS_ON)
;  582           0644  1       );
;  583           0645  1
;  584         P 0646  1 $STATE (,
;  585         P 0647  1       ('T'),
;  586         P 0648  1       ('t'),
;  587         P 0649  1       ('F'),
;  588         P 0650  1       ('f')
;  589           0651  1       );
;  590           0652  1
;  591           0653  1 !+
;  592           0654  1 ! Consume characters up to but not including the next delimiter.
;  593           0655  1 !-
;  594         P 0656  1 $STATE (LOGICAL1,
;  595         P 0657  1       ((LOGICAL2), LOGICAL1),
;  596         P 0658  1       (TPA$_LAMBDA, TPA$_EXIT, BLANKS_OFF)
;  597           0659  1       );
;  598           0660  1
;  599           0661  1 !+
;  600           0662  1 ! Indicates by failing if any of the selected characters are found.
;  601           0663  1 !-
;  602         P 0664  1 $STATE (LOGICAL2,
;  603         P 0665  1       ((END_OF_LINE), TPA$_FAIL),
;  604         P 0666  1       (TPA$_BLANK, TPA$_FAIL),
;  605         P 0667  1       (',', TPA$_FAIL),
;  606         P 0668  1       ('(', TPA$_FAIL),
;  607         P 0669  1       ('=', TPA$_FAIL),
;  608         P 0670  1       ('$', TPA$_FAIL),
;  609         P 0671  1       ('&', TPA$_FAIL),
;  610         P 0672  1       (TPA$_ANY, TPA$_EXIT)
;  611           0673  1       );
;  612           0674  1
;  613           0675  1 !+
;  614           0676  1 ! Parse and store the representation of a complex value.  This is safe because
;  615           0677  1 ! a complex value can not possibly be an identifier.
;  616         P 0678  1 $STATE (COMPLEX,
;  617         P 0679  1       ('(', COMPLEX2)
    );

$STATE (COMPLEX2,
    ((END_OF_LINE), COMPLEX2, NEXT_RECORD),
    (TPA$_BLANK, COMPLEX2),
    ((REAL), COMPLEX3, STORE_COMPLEX),  ! Store real part
    (TPA$_LAMBDA, ERROR_STATE)
    );

$STATE (COMPLEX3,
    ((END_OF_LINE), COMPLEX3, NEXT_RECORD),
    (TPA$_BLANK, COMPLEX3),
    (',', COMPLEX4),
    (TPA$_LAMBDA, ERROR_STATE)
    );

$STATE (COMPLEX4,
    ((END_OF_LINE), COMPLEX4, NEXT_RECORD),
    (TPA$_BLANK, COMPLEX4),
    ((REAL), COMPLEX5, STORE_COMPLEX),  ! Store imaginary part
    (TPA$_LAMBDA, ERROR_STATE)
    );

$STATE (COMPLEX5,
    ((END_OF_LINE), COMPLEX5, NEXT_RECORD),
    (TPA$_BLANK, COMPLEX5),
    (')', TPA$_EXIT),
    (TPA$_LAMBDA, ERROR_STATE)
    );

!+
! Pattern for a character string.  Inside the string, two consecutive quotes
! are counted as one.  This value is stored in the user variable as it goes,
! since this can not possibly be an identifier.
!-
$STATE (CHARACTER,
    (SINGLE_QUOTE, CHARACTER1, STRING_OK)          ! Signals error if not type CHARACTER
    );                                             ! Also turns on TPA$V_BLANKS

$STATE (CHARACTER1,
    (TPA$_EOS, CHARACTER1, NEXT_RECORD),           ! Don't use END_OF_LINE because
    (SINGLE_QUOTE, NEXT_QUOTE),                    ! a "!" is a valid character.
    (TPA$_ANY, CHARACTER1, STORE_CHARACTER)
    );

$STATE (NEXT_QUOTE,
    (TPA$_EOS, NEXT_QUOTE, NEXT_RECORD),           ! Don't use END_OF_LINE.
    (SINGLE_QUOTE, CHARACTER1, STORE_CHARACTER),
    (TPA$_LAMBDA, TPA$_EXIT)
    );

!+
! This state is transferred to if a syntax error is detected in the parsing. It
! calls SYNTAX_ERROR with a token which is at or near where the error was.
! SYNTAX_ERROR signals FOR$_SYNERRNAM.
!-
$STATE (ERROR_STATE,
P 1       (TPA$_ANY, TPA$_FAIL, SYNTAX_ERROR),
P 1       (TPA$_LAMBDA, TPA$_FAIL, SYNTAX_ERROR)
  1       );
  1
  1 !+
  1 ! This state is transferred to when there is some invalid reference on a
  1 ! variable, i.e. subscripting a scalar, substringing a non-character or using
  1 ! non-integers in subscripts/substrings.  It calls INVREFVAR_ERROR which
  1 ! signals FOR$_INVREFVAR.
  1 !-
P 1 $STATE (INVREFVAR_STATE,
P 1       (TPA$_LAMBDA, TPA$_FAIL, INVREFVAR_ERROR)
  1       );
  1 !<BLF/PAGE>
```

```
1 %SBTTL 'NEXT_RECORD - Get next record'
1 ROUTINE NEXT_RECORD =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       Reads a new record from the current unit and updates the STRING pointers
1 !       in PARAM_BLOCK.
1 !
1 ! CALLING SEQUENCE:
1 !
1 !       status = NEXT_RECORD ()
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       AP      Points to PARAM_BLOCK
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       PARAM_BLOCK [TPA$L_STRINGPTR] is address of new record
1 !       PARAM_BLOCK [TPA$L_STRINGCNT] is record length
1 !
1 ! COMPLETION STATUS:
1 !
1 !       1 for success; all errors are signalled.
1 !
1 ! SIDE EFFECTS:
1 !
1 !
1 !
1 !--
1
2   BEGIN
2
2   BUILTIN
2       AP;                 ! Argument pointer points to parameter block
2
2   MAP
2       AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
2
2   GLOBAL REGISTER
2       CCB = 11: REF $FOR$CCB_DECL;
2
2   CCB = .AP [NML$A_CCB];          ! Fetch CCB address
2   DO
3       BEGIN
3       FOR$$REC_RSNO ();                       ! Read the next record
3       CCB [LUB$A_BUF_PTR] = .CCB [LUB$A_BUF_PTR] + 1; ! Start with second byte
3       AP [TPA$L_STRINGPTR] = .CCB [LUB$A_BUF_PTR];
3       AP [TPA$L_STRINGCNT] = .CCB [LUB$A_BUF_END] - .CCB [LUB$A_BUF_PTR];
3       END
2   UNTIL .AP [TPA$L_STRINGCNT] GTR 0;
2   RETURN 1;
```

```
;  747          0808  2
;  748          0809  1      END;


                                                                    .TITLE  FOR$$NML_TABLES FOR$$NML_TABLES - TPARSE state
;                                                                                                tables for NAMEL
                                                                    .IDENT  \1-012\

                                                                    .PSECT  _LIB$STATE$,NOWRT,  SHR,  PIC,1

                                                  00000 FOR$A_NMLSTATE::
                                                                    .BLKB   0
                                                  00000 BEGIN_SCAN:
                                                                    .BLKB   0
                                            99F8  00000 ;TPA$TYPE
                                                        U.2:        .WORD   -26120                                            ;
                                           0000*  00002 ;TPA$SUBEXP
                                                        U.4:        .WORD   <<U.3-U.4>-2>                                     ;
                                       00000000*  00004 ;TPA$ACTION
                                                        U.5:        .LONG   <<NEXT_RECORD-U.5>-4>                             ;
                                           0000*  00008 ;TPA$TARGET
                                                        U.6:        .WORD   <<BEGIN_SCAN-U.6>-2>                              ;
                                            1024  0000A ;TPA$TYPE
                                                        U.7:        .WORD   4132                                              ;
                                            FFFF  0000C ;TPA$TARGET
                                                        U.8:        .WORD   -1                                                ;
                                            1026  0000E ;TPA$TYPE
                                                        U.9:        .WORD   4134                                              ;
                                            FFFF  00010 ;TPA$TARGET
                                                        U.10:       .WORD   -1                                                ;
                                            99F8  00012 ;TPA$TYPE
                                                        U.11:       .WORD   -26120                                            ;
                                           0000*  00014 ;TPA$SUBEXP
                                                        U.13:       .WORD   <<U.12-U.13>-2>                                   ;
                                       00000000V  00016 ;TPA$ACTION
                                                        U.14:       .LONG   <<BLANKS_OFF-U.14>-4>                             ;
                                           0000*  0001A ;TPA$TARGET
                                                        U.15:       .WORD   <<BEGIN_SCAN-U.15>-2>                             ;
                                            15F6  0001C ;TPA$TYPE
                                                        U.16:       .WORD   5622                                              ;
                                           0000*  0001E ;TPA$TARGET
                                                        U.18:       .WORD   <<U.17-U.18>-2>                                   ;
                                                  00020 ;END_OF_LINE
                                                        U.3:        .BLKB   0
                                            11F7  00020 ;TPA$TYPE
                                                        U.19:       .WORD   4599                                              ;
                                            FFFF  00022 ;TPA$TARGET
                                                        U.20:       .WORD   -1                                                ;
                                            19F8  00024 ;TPA$TYPE
                                                        U.21:       .WORD   6648                                              ;
                                           0000*  00026 ;TPA$SUBEXP
                                                        U.23:       .WORD   <<U.22-U.23>-2>                                   ;
                                            FFFE  00028 ;TPA$TARGET
                                                        U.24:       .WORD   -2                                                ;
                                            15F6  0002A ;TPA$TYPE
                                                        U.25:       .WORD   5622                                              ;
                                            FFFF  0002C ;TPA$TARGET
```

```
                          U.26:      .WORD     -1                                  ;
                  0002E   ;ASSIGNMENT
                          U.12:      .BLKB     0
            99F8  0002E   ;TPA$TYPE
                          U.27:      .WORD     -26120                              ;
           0000*  00030   ;TPA$SUBEXP
                          U.29:      .WORD     <<U.28-U.29>-2>                     ;
       00000000V  00032   ;TPA$ACTION
                          U.30:      .LONG     <<BLANKS_OFF-U.30>-4>               ;
           0000*  00036   ;TPA$TARGET
                          U.32:      .WORD     <<U.31-U.32>-2>                     ;
            903F  00038   ;TPA$TYPE
                          U.33:      .WORD     -28609                              ;
       00000000V  0003A   ;TPA$ACTION
                          U.34:      .LONG     <<DUMP_NAMES-U.34>-4>               ;
           0000*  0003E   ;TPA$TARGET
                          U.36:      .WORD     <<U.35-U.36>-2>                     ;
            99F8  00040   ;TPA$TYPE
                          U.37:      .WORD     -26120                              ;
           0000*  00042   ;TPA$SUBEXP
                          U.39:      .WORD     <<U.38-U.39>-2>                     ;
       00000000V  00044   ;TPA$ACTION
                          U.40:      .LONG     <<DUMP_VALUES-U.40>-4>              ;
           0000*  00048   ;TPA$TARGET
                          U.41:      .WORD     <<U.35-U.41>-2>                     ;
            15F6  0004A   ;TPA$TYPE
                          U.42:      .WORD     5622                                ;
           0000*  0004C   ;TPA$TARGET
                          U.43:      .WORD     <<U.17-U.43>-2>                     ;
                  0004E   ;FLUSH_RECORD
                          U.35:      .BLKB     0
            11F7  0004E   ;TPA$TYPE
                          U.44:      .WORD     4599                                ;
            FFFF  00050   ;TPA$TARGET
                          U.45:      .WORD     -1                                  ;
            15ED  00052   ;TPA$TYPE
                          U.46:      .WORD     5613                                ;
           0000*  00054   ;TPA$TARGET
                          U.47:      .WORD     <<U.35-U.47>-2>                     ;
                  00056   ;ASSN_EQL
                          U.31:      .BLKB     0
            99F8  00056   ;TPA$TYPE
                          U.48:      .WORD     -26120                              ;
           0000*  00058   ;TPA$SUBEXP
                          U.49:      .WORD     <<U.3-U.49>-2>                      ;
       00000000*  0005A   ;TPA$ACTION
                          U.50:      .LONG     <<NEXT_RECORD-U.50>-4>              ;
           0000*  0005E   ;TPA$TARGET
                          U.51:      .WORD     <<U.31-U.51>-2>                     ;
            103D  00060   ;TPA$TYPE
                          U.52:      .WORD     4157                                ;
           0000*  00062   ;TPA$TARGET
                          U.54:      .WORD     <<U.53-U.54>-2>                     ;
            15F6  00064   ;TPA$TYPE
                          U.55:      .WORD     5622                                ;
           0000*  00066   ;TPA$TARGET
                          U.56:      .WORD     <<U.17-U.56>-2>                     ;
```

```
                 00068 ;VALUE_LIST
                       U.53:    .BLKB   0
          99F8   00068 ;TPA$TYPE
                       U.57:    .WORD   -26120                                      ;
          0000*  0006A ;TPA$SUBEXP
                       U.58:    .WORD   <<U.3-U.58>-2>                              ;
      00000000*  0006C ;TPA$ACTION
                       U.59:    .LONG   <<NEXT_RECORD-U.59>-4>                      ;
          0000*  00070 ;TPA$TARGET
                       U.60:    .WORD   <<U.53-U.60>-2>                             ;
          902C   00072 ;TPA$TYPE
                       U.61:    .WORD   -28628                                      ;
      00000000V  00074 ;TPA$ACTION
                       U.62:    .LONG   <<NULL_VALUE-U.62>-4>                       ;
          0000*  00078 ;TPA$TARGET
                       U.63:    .WORD   <<U.53-U.63>-2>                             ;
          99F8   0007A ;TPA$TYPE
                       U.64:    .WORD   -26120                                      ;
          0000*  0007C ;TPA$SUBEXP
                       U.66:    .WORD   <<U.65-U.66>-2>                             ;
      00000000V  0007E ;TPA$ACTION
                       U.67:    .LONG   <<BLANKS_ON-U.67>-4>                        ;
          0000*  00082 ;TPA$TARGET
                       U.69:    .WORD   <<U.68-U.69>-2>                             ;
          99F8   00084 ;TPA$TYPE
                       U.70:    .WORD   -26120                                      ;
          0000*  00086 ;TPA$SUBEXP
                       U.72:    .WORD   <<U.71-U.72>-2>                             ;
      00000000V  00088 ;TPA$ACTION
                       U.73:    .LONG   <<BLANKS_ON-U.73>-4>                        ;
          0000*  0008C ;TPA$TARGET
                       U.74:    .WORD   <<U.68-U.74>-2>                             ;
          15F6   0008E ;TPA$TYPE
                       U.75:    .WORD   5622                                        ;
          FFFF   00090 ;TPA$TARGET
                       U.76:    .WORD   -1                                          ;
                 00092 ;VALUE_LIST1
                       U.68:    .BLKB   0
          99F8   00092 ;TPA$TYPE
                       U.77:    .WORD   -26120                                      ;
          0000*  00094 ;TPA$SUBEXP
                       U.78:    .WORD   <<U.3-U.78>-2>                              ;
      00000000V  00096 ;TPA$ACTION
                       U.79:    .LONG   <<BLANKS_OFF-U.79>-4>                       ;
          0000*  0009A ;TPA$TARGET
                       U.81:    .WORD   <<U.80-U.81>-2>                             ;
          91F2   0009C ;TPA$TYPE
                       U.82:    .WORD   -28174                                      ;
      00000000V  0009E ;TPA$ACTION
                       U.83:    .LONG   <<BLANKS_OFF-U.83>-4>                       ;
          0000*  000A2 ;TPA$TARGET
                       U.84:    .WORD   <<U.80-U.84>-2>                             ;
          99F8   000A4 ;TPA$TYPE
                       U.85:    .WORD   -26120                                      ;
          0000*  000A6 ;TPA$SUBEXP
                       U.87:    .WORD   <<U.86-U.87>-2>                             ;
      00000000V  000A8 ;TPA$ACTION
```

```
                                   U.88:    .LONG     <<BLANKS_OFF-U.88>-4>                 ;
              0000*  000AC  ;TPA$TARGET
                                   U.89:    .WORD     <<U.80-U.89>-2>                       ;
              95F6   000AE  ;TPA$TYPE
                                   U.90:    .WORD     -27146                                ;
         00000000V   000B0  ;TPA$ACTION
                                   U.91:    .LONG     <<SET_VALUE_IDENT-U.91>-4>            ;
              FFFF   000B4  ;TPA$TARGET
                                   U.92:    .WORD     -1                                    ;
                     000B6  ;VALUE_LIST2
                                   U.80:    .BLKB     0
              99F8   000B6  ;TPA$TYPE
                                   U.93:    .WORD     -26120                                ;
              0000*  000B8  ;TPA$SUBEXP
                                   U.94:    .WORD     <<U.3-U.94>-2>                        ;
         00000000*   000BA  ;TPA$ACTION
                                   U.95:    .LONG     <<NEXT_RECORD-U.95>-4>                ;
              0000*  000BE  ;TPA$TARGET
                                   U.96:    .WORD     <<U.80-U.96>-2>                       ;
              11F2   000C0  ;TPA$TYPE
                                   U.97:    .WORD     4594                                  ;
              0000*  000C2  ;TPA$TARGET
                                   U.98:    .WORD     <<U.80-U.98>-2>                       ;
              902C   000C4  ;TPA$TYPE
                                   U.99:    .WORD     -28628                                ;
         00000000V   000C6  ;TPA$ACTION
                                   U.100:   .LONG     <<STORE_VALUE-U.100>-4>               ;
              0000*  000CA  ;TPA$TARGET
                                   U.101:   .WORD     <<U.53-U.101>-2>                      ;
              99F8   000CC  ;TPA$TYPE
                                   U.102:   .WORD     -26120                                ;
              0000*  000CE  ;TPA$SUBEXP
                                   U.104:   .WORD     <<U.103-U.104>-2>                     ;
         00000000V   000D0  ;TPA$ACTION
                                   U.105:   .LONG     <<STORE_VALUE-U.105>-4>               ;
              0000*  000D4  ;TPA$TARGET
                                   U.106:   .WORD     <<U.53-U.106>-2>                      ;
              95F6   000D6  ;TPA$TYPE
                                   U.107:   .WORD     -27146                                ;
         00000000V   000D8  ;TPA$ACTION
                                   U.108:   .LONG     <<SET_VALUE_IDENT-U.108>-4>           ;
              FFFF   000DC  ;TPA$TARGET
                                   U.109:   .WORD     -1                                    ;
                     000DE  ;NO_LPAREN
                                   U.86:    .BLKB     0
              1028   000DE  ;TPA$TYPE
                                   U.110:   .WORD     4136                                  ;
              FFFE   000E0  ;TPA$TARGET
                                   U.111:   .WORD     -2                                    ;
              15F6   000E2  ;TPA$TYPE
                                   U.112:   .WORD     5622                                  ;
              FFFF   000E4  ;TPA$TARGET
                                   U.113:   .WORD     -1                                    ;
                     000E6  ;NO_EQUALS
                                   U.103:   .BLKB     0
              19F8   000E6  ;TPA$TYPE
                                   U.114:   .WORD     6648                                  ;
```

```
          0000* 000E8 ;TPA$SUBEXP
                      U.116:  .WORD   <<U.115-U.116>-2>                               ;
          0000* 000EA ;TPA$TARGET
                      U.118:  .WORD   <<U.117-U.118>-2>                               ;
           15F6 000EC ;TPA$TYPE
                      U.119:  .WORD   5622                                            ;
           FFFF 000EE ;TPA$TARGET
                      U.120:  .WORD   -1                                              ;
                000F0 ;NO_EQUALS2
                      U.117:  .BLKB   0
           103D 000F0 ;TPA$TYPE
                      U.121:  .WORD   4157                                            ;
           FFFE 000F2 ;TPA$TARGET
                      U.122:  .WORD   -2                                              ;
           15F6 000F4 ;TPA$TYPE
                      U.123:  .WORD   5622                                            ;
           FFFF 000F6 ;TPA$TARGET
                      U.124:  .WORD   -1                                              ;
                000F8 ;NO_EQUALS_QUESTION
                      U.115:  .BLKB   0
           19F8 000F8 ;TPA$TYPE
                      U.125:  .WORD   6648                                            ;
          0000* 000FA ;TPA$SUBEXP
                      U.126:  .WORD   <<U.38-U.126>-2>                                ;
           FFFE 000FC ;TPA$TARGET
                      U.127:  .WORD   -2                                              ;
           15F6 000FE ;TPA$TYPE
                      U.128:  .WORD   5622                                            ;
           FFFF 00100 ;TPA$TARGET
                      U.129:  .WORD   -1                                              ;
                00102 ;EQUALS_QUESTION
                      U.38:   .BLKB   0
           843D 00102 ;TPA$TYPE
                      U.130:  .WORD   -31683                                          ;
      00000000V 00104 ;TPA$ACTION
                      U.131:  .LONG   <<BLANKS_ON-U.131>-4>                           ;
           903F 00108 ;TPA$TYPE
                      U.132:  .WORD   -28609                                          ;
      00000000V 0010A ;TPA$ACTION
                      U.133:  .LONG   <<BLANKS_OFF-U.133>-4>                          ;
           FFFF 0010E ;TPA$TARGET
                      U.134:  .WORD   -1                                              ;
           95F6 00110 ;TPA$TYPE
                      U.135:  .WORD   -27146                                          ;
      00000000V 00112 ;TPA$ACTION
                      U.136:  .LONG   <<BLANKS_OFF-U.136>-4>                          ;
           FFFE 00116 ;TPA$TARGET
                      U.137:  .WORD   -2                                              ;
                00118 ;NO_COMMENT
                      U.22:   .BLKB   0
           1021 00118 ;TPA$TYPE
                      U.138:  .WORD   4129                                            ;
           FFFE 0011A ;TPA$TARGET
                      U.139:  .WORD   -2                                              ;
           15F6 0011C ;TPA$TYPE
                      U.140:  .WORD   5622                                            ;
           FFFF 0011E ;TPA$TARGET
```

```
                                U.141:  .WORD   -1                              ;
                         00120 ;REPEATED_VALUE
                                U.65:   .BLKB   0
                  95F3   00120 ;TPA$TYPE
                                U.142:  .WORD   -27149                          ;
             00000000V   00122 ;TPA$ACTION
                                U.143:  .LONG   <<BLANKS_ON-U.143>-4>           ;
                 0000*   00126 ;TPA$TARGET
                                U.145:  .WORD   <<U.144-U.145>-2>               ;
                         00128 ;REPEAT2
                                U.144:  .BLKB   0
                  902A   00128 ;TPA$TYPE
                                U.146:  .WORD   -28630                          ;
             00000000V   0012A ;TPA$ACTION
                                U.147:  .LONG   <<STORE_REPEAT-U.147>-4>        ;
                 0000*   0012E ;TPA$TARGET
                                U.149:  .WORD   <<U.148-U.149>-2>               ;
                  95F6   00130 ;TPA$TYPE
                                U.150:  .WORD   -27146                          ;
             00000000V   00132 ;TPA$ACTION
                                U.151:  .LONG   <<BLANKS_OFF-U.151>-4>          ;
                  FFFE   00136 ;TPA$TARGET
                                U.152:  .WORD   -2                              ;
                         00138 ;REPEAT3
                                U.148:  .BLKB   0
                  99F8   00138 ;TPA$TYPE
                                U.153:  .WORD   -26120                          ;
                 0000*   0013A ;TPA$SUBEXP
                                U.154:  .WORD   <<U.71-U.154>-2>                ;
             00000000V   0013C ;TPA$ACTION
                                U.155:  .LONG   <<END_REPEAT-U.155>-4>          ;
                  FFFF   00140 ;TPA$TARGET
                                U.156:  .WORD   -1                              ;
                  19F8   00142 ;TPA$TYPE
                                U.157:  .WORD   6648                            ;
                 0000*   00144 ;TPA$SUBEXP
                                U.159:  .WORD   <<U.158-U.159>-2>               ;
                 0000*   00146 ;TPA$TARGET
                                U.160:  .WORD   <<U.17-U.160>-2>                ;
                  95F6   00148 ;TPA$TYPE
                                U.161:  .WORD   -27146                          ;
             00000000V   0014A ;TPA$ACTION
                                U.162:  .LONG   <<BLANKS_OFF-U.162>-4>          ;
                  FFFF   0014E ;TPA$TARGET
                                U.163:  .WORD   -1                              ;
                         00150 ;VALUE
                                U.71:   .BLKB   0
                  99F8   00150 ;TPA$TYPE
                                U.164:  .WORD   -26120                          ;
                 0000*   00152 ;TPA$SUBEXP
                                U.166:  .WORD   <<U.165-U.166>-2>               ;
             00000000V   00154 ;TPA$ACTION
                                U.167:  .LONG   <<STORE_LOGICAL-U.167>-4>       ;
                  FFFF   00158 ;TPA$TARGET
                                U.168:  .WORD   -1                              ;
                  99F8   0015A ;TPA$TYPE
                                U.169:  .WORD   -26120                          ;
             0000*  0015C ;TPA$SUBEXP
                          U.171:  .WORD   <<U.170-U.171>-2>                                    ;
         00000000V  0015E ;TPA$ACTION
                          U.172:  .LONG   <<STORE_REAL-U.172>-4>                               ;
             FFFF   00162 ;TPA$TARGET
                          U.173:  .WORD   -1                                                   ;
             19F8   00164 ;TPA$TYPE
                          U.174:  .WORD   6648                                                 ;
             0000*  00166 ;TPA$SUBEXP
                          U.176:  .WORD   <<U.175-U.176>-2>                                    ;
             FFFF   00168 ;TPA$TARGET
                          U.177:  .WORD   -1                                                   ;
             9DF8   0016A ;TPA$TYPE
                          U.178:  .WORD   -25096                                               ;
             0000*  0016C ;TPA$SUBEXP
                          U.180:  .WORD   <<U.179-U.180>-2>                                    ;
         00000000V  0016E ;TPA$ACTION
                          U.181:  .LONG   <<END_CHARACTER-U.181>-4>                            ;
             FFFF   00172 ;TPA$TARGET
                          U.182:  .WORD   -1                                                   ;
                    00174 ;VARIABLE
                          U.28:   .BLKB   0
             91F6   00174 ;TPA$TYPE
                          U.183:  .WORD   -28170                                               ;
         00000000V  00176 ;TPA$ACTION
                          U.184:  .LONG   <<WAS_VALUE_IDENT-U.184>-4>                          ;
             0000*  0017A ;TPA$TARGET
                          U.186:  .WORD   <<U.185-U.186>-2>                                    ;
             9DF8   0017C ;TPA$TYPE
                          U.187:  .WORD   -25096                                               ;
             0000*  0017E ;TPA$SUBEXP
                          U.189:  .WORD   <<U.188-U.189>-2>                                    ;
         00000000V  00180 ;TPA$ACTION
                          U.190:  .LONG   <<LOOKUP_IDENTIFIER-U.190>-4>                        ;
             0000*  00184 ;TPA$TARGET
                          U.191:  .WORD   <<U.185-U.191>-2>                                    ;
                    00186 ;VARIABLE2
                          U.185:  .BLKB   0
             85F6   00186 ;TPA$TYPE
                          U.192:  .WORD   -31242                                               ;
         00000000V  00188 ;TPA$ACTION
                          U.193:  .LONG   <<BLANKS_ON-U.193>-4>                                ;
                    0018C SUBSCRIPT_START:
                                  .BLKB   0
             9028   0018C ;TPA$TYPE
                          U.194:  .WORD   -28632                                               ;
         00000000V  0018E ;TPA$ACTION
                          U.195:  .LONG   <<INIT_SUBS-U.195>-4>                                ;
             0000*  00192 ;TPA$TARGET
                          U.197:  .WORD   <<U.196-U.197>-2>                                    ;
             15F6   00194 ;TPA$TYPE
                          U.198:  .WORD   5622                                                 ;
             FFFF   00196 ;TPA$TARGET
                          U.199:  .WORD   -1                                                   ;
                    00198 ;SUB_LOOP1
                          U.196:  .BLKB   0
             99F8   00198 ;TPA$TYPE
```

```
                                   U.200:   .WORD      -26120                                    ;
              0000*  0019A  ;TPA$SUBEXP
                                   U.201:   .WORD      <<U.3-U.201>-2>                           ;
          00000000*  0019C  ;TPA$ACTION
                                   U.202:   .LONG      <<NEXT_RECORD-U.202>-4>                   ;
              0000*  001A0  ;TPA$TARGET
                                   U.203:   .WORD      <<U.196-U.203>-2>                         ;
              11F2   001A2  ;TPA$TYPE
                                   U.204:   .WORD      4594                                      ;
              0000*  001A4  ;TPA$TARGET
                                   U.205:   .WORD      <<U.196-U.205>-2>                         ;
              89F8   001A6  ;TPA$TYPE
                                   U.206:   .WORD      -30216                                    ;
              0000*  001A8  ;TPA$SUBEXP
                                   U.208:   .WORD      <<U.207-U.208>-2>                         ;
          00000000V  001AA  ;TPA$ACTION
                                   U.209:   .LONG      <<STORE_SUBS-U.209>-4>                    ;
              903A   001AE  ;TPA$TYPE
                                   U.210:   .WORD      -28614                                    ;
          00000000V  001B0  ;TPA$ACTION
                                   U.211:   .LONG      <<SUBSTRING_COLON-U.211>-4>               ;
              0000*  001B4  ;TPA$TARGET
                                   U.213:   .WORD      <<U.212-U.213>-2>                         ;
              15F6   001B6  ;TPA$TYPE
                                   U.214:   .WORD      5622                                      ;
              0000*  001B8  ;TPA$TARGET
                                   U.216:   .WORD      <<U.215-U.216>-2>                         ;
                     001BA  SUB_LOOP2:
                                            .BLKB      0
              99F8   001BA  ;TPA$TYPE
                                   U.217:   .WORD      -26120                                    ;
              0000*  001BC  ;TPA$SUBEXP
                                   U.218:   .WORD      <<U.3-U.218>-2>                           ;
          00000000*  001BE  ;TPA$ACTION
                                   U.219:   .LONG      <<NEXT_RECORD-U.219>-4>                   ;
              0000*  001C2  ;TPA$TARGET
                                   U.220:   .WORD      <<SUB_LOOP2-U.220>-2>                     ;
              11F2   001C4  ;TPA$TYPE
                                   U.221:   .WORD      4594                                      ;
              0000*  001C6  ;TPA$TARGET
                                   U.222:   .WORD      <<SUB_LOOP2-U.222>-2>                     ;
              102C   001C8  ;TPA$TYPE
                                   U.223:   .WORD      4140                                      ;
              0000*  001CA  ;TPA$TARGET
                                   U.225:   .WORD      <<U.224-U.225>-2>                         ;
              903A   001CC  ;TPA$TYPE
                                   U.226:   .WORD      -28614                                    ;
          00000000V  001CE  ;TPA$ACTION
                                   U.227:   .LONG      <<SUBSTRING_COLON-U.227>-4>               ;
              0000*  001D2  ;TPA$TARGET
                                   U.228:   .WORD      <<U.212-U.228>-2>                         ;
              9029   001D4  ;TPA$TYPE
                                   U.229:   .WORD      -28631                                    ;
          00000000V  001D6  ;TPA$ACTION
                                   U.230:   .LONG      <<END_SUBSCRIPT-U.230>-4>                 ;
              0000*  001DA  ;TPA$TARGET
                                   U.232:   .WORD      <<U.231-U.232>-2>                         ;
```

```
      15F6  001DC ;TPA$TYPE
                  U.233:   .WORD     5622                                         ;
     0000*  001DE ;TPA$TARGET
                  U.234:   .WORD     <<U.17-U.234>-2>                             ;
            001E0 ;SUB_LOOP3
                  U.224:   .BLKB     0
      99F8  001E0 ;TPA$TYPE
                  U.235:   .WORD     -26120                                       ;
     0000*  001E2 ;TPA$SUBEXP
                  U.236:   .WORD     <<U.3-U.236>-2>                              ;
 00000000*  001E4 ;TPA$ACTION
                  U.237:   .LONG     <<NEXT_RECORD-U.237>-4>                      ;
     0000*  001E8 ;TPA$TARGET
                  U.238:   .WORD     <<U.224-U.238>-2>                            ;
      11F2  001EA ;TPA$TYPE
                  U.239:   .WORD     4594                                         ;
     0000*  001EC ;TPA$TARGET
                  U.240:   .WORD     <<U.224-U.240>-2>                            ;
      99F8  001EE ;TPA$TYPE
                  U.241:   .WORD     -26120                                       ;
     0000*  001F0 ;TPA$SUBEXP
                  U.242:   .WORD     <<U.207-U.242>-2>                            ;
 00000000V  001F2 ;TPA$ACTION
                  U.243:   .LONG     <<STORE_SUBS-U.243>-4>                       ;
     0000*  001F6 ;TPA$TARGET
                  U.244:   .WORD     <<SUB_LOOP2-U.244>-2>                        ;
      15F6  001F8 ;TPA$TYPE
                  U.245:   .WORD     5622                                         ;
     0000*  001FA ;TPA$TARGET
                  U.246:   .WORD     <<U.215-U.246>-2>                            ;
            001FC ;START_SUBSTRING
                  U.231:   .BLKB     0
      8028  001FC ;TPA$TYPE
                  U.247:   .WORD     -32728                                       ;
 00000000V  001FE ;TPA$ACTION
                  U.248:   .LONG     <<INIT_SUBS-U.248>-4>                        ;
      15F6  00202 ;TPA$TYPE
                  U.249:   .WORD     5622                                         ;
      FFFF  00204 ;TPA$TARGET
                  U.250:   .WORD     -1                                           ;
            00206 LEFT_SUBSTRING:
                           .BLKB     0
      99F8  00206 ;TPA$TYPE
                  U.251:   .WORD     -26120                                       ;
     0000*  00208 ;TPA$SUBEXP
                  U.252:   .WORD     <<U.3-U.252>-2>                              ;
 00000000*  0020A ;TPA$ACTION
                  U.253:   .LONG     <<NEXT_RECORD-U.253>-4>                      ;
     0000*  0020E ;TPA$TARGET
                  U.254:   .WORD     <<LEFT_SUBSTRING-U.254>-2>                   ;
      11F2  00210 ;TPA$TYPE
                  U.255:   .WORD     4594                                         ;
     0000*  00212 ;TPA$TARGET
                  U.256:   .WORD     <<LEFT_SUBSTRING-U.256>-2>                   ;
      99F8  00214 ;TPA$TYPE
                  U.257:   .WORD     -26120                                       ;
     0000*  00216 ;TPA$SUBEXP
```

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                                      U.258:  .WORD    <<U.207-U.258>-2>                     ;
                  00000000V 00218 ;TPA$ACTION
                                      U.259:  .LONG    <<STORE_SUBS-U.259>-4>                ;
                      0000* 0021C ;TPA$TARGET
                                      U.261:  .WORD    <<U.260-U.261>-2>                     ;
                       903A 0021E ;TPA$TYPE
                                      U.262:  .WORD    -28614                                ;
                  00000000V 00220 ;TPA$ACTION
                                      U.263:  .LONG    <<SUBSTRING_COLON-U.263>-4>           ;
                      0000* 00224 ;TPA$TARGET
                                      U.264:  .WORD    <<U.212-U.264>-2>                     ;
                       15F6 00226 ;TPA$TYPE
                                      U.265:  .WORD    5622                                  ;
                      0000* 00228 ;TPA$TARGET
                                      U.266:  .WORD    <<U.215-U.266>-2>                     ;
                            0022A ;SUBSTRING2
                                      U.260:  .BLKB    0
                       99F8 0022A ;TPA$TYPE
                                      U.267:  .WORD    -26120                                ;
                      0000* 0022C ;TPA$SUBEXP
                                      U.268:  .WORD    <<U.3-U.268>-2>                       ;
                  00000000* 0022E ;TPA$ACTION
                                      U.269:  .LONG    <<NEXT_RECORD-U.269>-4>               ;
                      0000* 00232 ;TPA$TARGET
                                      U.270:  .WORD    <<U.260-U.270>-2>                     ;
                       11F2 00234 ;TPA$TYPE
                                      U.271:  .WORD    4594                                  ;
                      0000* 00236 ;TPA$TARGET
                                      U.272:  .WORD    <<U.260-U.272>-2>                     ;
                       903A 00238 ;TPA$TYPE
                                      U.273:  .WORD    -28614                                ;
                  00000000V 0023A ;TPA$ACTION
                                      U.274:  .LONG    <<SUBSTRING_COLON-U.274>-4>           ;
                      0000* 0023E ;TPA$TARGET
                                      U.275:  .WORD    <<U.212-U.275>-2>                     ;
                       15F6 00240 ;TPA$TYPE
                                      U.276:  .WORD    5622                                  ;
                      0000* 00242 ;TPA$TARGET
                                      U.277:  .WORD    <<U.17-U.277>-2>                      ;
                            00244 ;RIGHT_SUBSTRING
                                      U.212:  .BLKB    0
                       99F8 00244 ;TPA$TYPE
                                      U.278:  .WORD    -26120                                ;
                      0000* 00246 ;TPA$SUBEXP
                                      U.279:  .WORD    <<U.3-U.279>-2>                       ;
                  00000000* 00248 ;TPA$ACTION
                                      U.280:  .LONG    <<NEXT_RECORD-U.280>-4>               ;
                      0000* 0024C ;TPA$TARGET
                                      U.281:  .WORD    <<U.212-U.281>-2>                     ;
                       11F2 0024E ;TPA$TYPE
                                      U.282:  .WORD    4594                                  ;
                      0000* 00250 ;TPA$TARGET
                                      U.283:  .WORD    <<U.212-U.283>-2>                     ;
                       99F8 00252 ;TPA$TYPE
                                      U.284:  .WORD    -26120                                ;
                      0000* 00254 ;TPA$SUBEXP
                                      U.285:  .WORD    <<U.207-U.285>-2>                     ;
```

```
 00000000V 00256 ;TPA$ACTION
                 U.286:  .LONG   <<STORE_SUBS-U.286>-4>                          ;
     0000* 0025A ;TPA$TARGET
                 U.288:  .WORD   <<U.287-U.288>-2>                               ;
      9029 0025C ;TPA$TYPE
                 U.289:  .WORD   -28631                                          ;
 00000000V 0025E ;TPA$ACTION
                 U.290:  .LONG   <<END_SUBSTRING-U.290>-4>                       ;
      FFFF 00262 ;TPA$TARGET
                 U.291:  .WORD   -1                                              ;
      15F6 00264 ;TPA$TYPE
                 U.292:  .WORD   5622                                            ;
     0000* 00266 ;TPA$TARGET
                 U.293:  .WORD   <<U.215-U.293>-2>                               ;
           00268 ;SUBSTRING3
                 U.287:  .BLKB   0
      99F8 00268 ;TPA$TYPE
                 U.294:  .WORD   -26120                                          ;
     0000* 0026A ;TPA$SUBEXP
                 U.295:  .WORD   <<U.3-U.295>-2>                                 ;
 00000000* 0026C ;TPA$ACTION
                 U.296:  .LONG   <<NEXT_RECORD-U.296>-4>                         ;
     0000* 00270 ;TPA$TARGET
                 U.297:  .WORD   <<U.287-U.297>-2>                               ;
      11F2 00272 ;TPA$TYPE
                 U.298:  .WORD   4594                                            ;
     0000* 00274 ;TPA$TARGET
                 U.299:  .WORD   <<U.287-U.299>-2>                               ;
      9029 00276 ;TPA$TYPE
                 U.300:  .WORD   -28631                                          ;
 00000000V 00278 ;TPA$ACTION
                 U.301:  .LONG   <<END_SUBSTRING-U.301>-4>                       ;
      FFFF 0027C ;TPA$TARGET
                 U.302:  .WORD   -1                                              ;
      15F6 0027E ;TPA$TYPE
                 U.303:  .WORD   5622                                            ;
     0000* 00280 ;TPA$TARGET
                 U.304:  .WORD   <<U.17-U.304>-2>                                ;
           00282 ;IDENTIFIER
                 U.188:  .BLKB   0
      85EE 00282 ;TPA$TYPE
                 U.305:  .WORD   -31250                                          ;
 00000000V 00284 ;TPA$ACTION
                 U.306:  .LONG   <<BLANKS_ON-U.306>-4>                           ;
      91F1 00288 ;TPA$TYPE
                 U.307:  .WORD   -28175                                          ;
 00000000V 0028A ;TPA$ACTION
                 U.308:  .LONG   <<BLANKS_OFF-U.308>-4>                          ;
      FFFF 0028E ;TPA$TARGET
                 U.309:  .WORD   -1                                              ;
      95F6 00290 ;TPA$TYPE
                 U.310:  .WORD   -27146                                          ;
 00000000V 00292 ;TPA$ACTION
                 U.311:  .LONG   <<BLANKS_OFF-U.311>-4>                          ;
      FFFF 00296 ;TPA$TARGET
                 U.312:  .WORD   -1                                              ;
           00298 ;DECIMAL_INTEGER
```

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                              U.207:   .BLKB   0
          9DF8  00298 ;TPA$TYPE
                              U.313:   .WORD   -25096                                                     ;
          0000* 0029A ;TPA$SUBEXP
                              U.315:   .WORD   <<U.314-U.315>-2>                                          ;
      00000000V 0029C ;TPA$ACTION
                              U.316:   .LONG   <<CONVERT_INTEGER-U.316>-4>                                ;
          FFFF  002A0 ;TPA$TARGET
                              U.317:   .WORD   -1                                                         ;
                002A2 ;INTEGER
                              U.314:   .BLKB   0
          802B  002A2 ;TPA$TYPE
                              U.318:   .WORD   -32725                                                     ;
      00000000V 002A4 ;TPA$ACTION
                              U.319:   .LONG   <<BLANKS_ON-U.319>-4>                                      ;
          802D  002A8 ;TPA$TYPE
                              U.320:   .WORD   -32723                                                     ;
      00000000V 002AA ;TPA$ACTION
                              U.321:   .LONG   <<BLANKS_ON-U.321>-4>                                      ;
          85F6  002AE ;TPA$TYPE
                              U.322:   .WORD   -31242                                                     ;
      00000000V 002B0 ;TPA$ACTION
                              U.323:   .LONG   <<BLANKS_ON-U.323>-4>                                      ;
          91F3  002B4 ;TPA$TYPE
                              U.324:   .WORD   -28173                                                     ;
      00000000V 002B6 ;TPA$ACTION
                              U.325:   .LONG   <<BLANKS_OFF-U.325>-4>                                     ;
          FFFF  002BA ;TPA$TARGET
                              U.326:   .WORD   -1                                                         ;
          95F6  002BC ;TPA$TYPE
                              U.327:   .WORD   -27146                                                     ;
      00000000V 002BE ;TPA$ACTION
                              U.328:   .LONG   <<BLANKS_OFF-U.328>-4>                                     ;
          FFFE  002C2 ;TPA$TARGET
                              U.329:   .WORD   -2                                                         ;
                002C4 ;REAL
                              U.170:   .BLKB   0
          802B  002C4 ;TPA$TYPE
                              U.330:   .WORD   -32725                                                     ;
      00000000V 002C6 ;TPA$ACTION
                              U.331:   .LONG   <<BLANKS_ON-U.331>-4>                                      ;
          802D  002CA ;TPA$TYPE
                              U.332:   .WORD   -32723                                                     ;
      00000000V 002CC ;TPA$ACTION
                              U.333:   .LONG   <<BLANKS_ON-U.333>-4>                                      ;
          85F6  002D0 ;TPA$TYPE
                              U.334:   .WORD   -31242                                                     ;
      00000000V 002D2 ;TPA$ACTION
                              U.335:   .LONG   <<BLANKS_ON-U.335>-4>                                      ;
                002D6 REAL1:   .BLKB   0
          11EF  002D6 ;TPA$TYPE
                              U.336:   .WORD   4591                                                       ;
          0000* 002D8 ;TPA$TARGET
                              U.337:   .WORD   <<REAL1-U.337>-2>                                          ;
          002E  002DA ;TPA$TYPE
                              U.338:   .WORD   46                                                         ;
          05F6  002DC ;TPA$TYPE
```

```
                        U.339:  .WORD   1526                                    ;
             002DE REAL2:   .BLKB   0
11EF         002DE ;TPA$TYPE
                        U.340:  .WORD   4591                                    ;
0000*        002E0 ;TPA$TARGET
                        U.341:  .WORD   <<REAL2-U.341>-2>                       ;
05F6         002E2 ;TPA$TYPE
                        U.342:  .WORD   1526                                    ;
             002E4 EXPONENT:
                                .BLKB   0
0045         002E4 ;TPA$TYPE
                        U.343:  .WORD   69                                      ;
0065         002E6 ;TPA$TYPE
                        U.344:  .WORD   101                                     ;
0044         002E8 ;TPA$TYPE
                        U.345:  .WORD   68                                      ;
0064         002EA ;TPA$TYPE
                        U.346:  .WORD   100                                     ;
0051         002EC ;TPA$TYPE
                        U.347:  .WORD   81                                      ;
0071         002EE ;TPA$TYPE
                        U.348:  .WORD   113                                     ;
05F6         002F0 ;TPA$TYPE
                        U.349:  .WORD   1526                                    ;
002B         002F2 ;TPA$TYPE
                        U.350:  .WORD   43                                      ;
002D         002F4 ;TPA$TYPE
                        U.351:  .WORD   45                                      ;
05F6         002F6 ;TPA$TYPE
                        U.352:  .WORD   1526                                    ;
             002F8 EXPONENT2:
                                .BLKB   0
11EF         002F8 ;TPA$TYPE
                        U.353:  .WORD   4591                                    ;
0000*        002FA ;TPA$TARGET
                        U.354:  .WORD   <<EXPONENT2-U.354>-2>                   ;
05F6         002FC ;TPA$TYPE
                        U.355:  .WORD   1526                                    ;
19F8         002FE ;TPA$TYPE
                        U.356:  .WORD   6648                                    ;
0000*        00300 ;TPA$SUBEXP
                        U.357:  .WORD   <<U.158-U.357>-2>                       ;
FFFE         00302 ;TPA$TARGET
                        U.358:  .WORD   -2                                      ;
15F6         00304 ;TPA$TYPE
                        U.359:  .WORD   5622                                    ;
FFFF         00306 ;TPA$TARGET
                        U.360:  .WORD   -1                                      ;
             00308 ;NOT_DELIM
                        U.158:  .BLKB   0
19F8         00308 ;TPA$TYPE
                        U.361:  .WORD   6648                                    ;
0000*        0030A ;TPA$SUBEXP
                        U.362:  .WORD   <<U.3-U.362>-2>                         ;
FFFE         0030C ;TPA$TARGET
                        U.363:  .WORD   -2                                      ;
11F2         0030E ;TPA$TYPE
```

```
                                  U.364:   .WORD    4594                                          ;
               FFFE   00310 ;TPA$TARGET
                                  U.365:   .WORD    -2                                            ;
               102C   00312 ;TPA$TYPE
                                  U.366:   .WORD    4140                                          ;
               FFFE   00314 ;TPA$TARGET
                                  U.367:   .WORD    -2                                            ;
               1024   00316 ;TPA$TYPE
                                  U.368:   .WORD    4132                                          ;
               FFFE   00318 ;TPA$TARGET
                                  U.369:   .WORD    -2                                            ;
               1026   0031A ;TPA$TYPE
                                  U.370:   .WORD    4134                                          ;
               FFFE   0031C ;TPA$TARGET
                                  U.371:   .WORD    -2                                            ;
               1029   0031E ;TPA$TYPE
                                  U.372:   .WORD    4137                                          ;
               FFFE   00320 ;TPA$TARGET
                                  U.373:   .WORD    -2                                            ;
               15F6   00322 ;TPA$TYPE
                                  U.374:   .WORD    5622                                          ;
               FFFF   00324 ;TPA$TARGET
                                  U.375:   .WORD    -1                                            ;
                      00326 ;LOGICAL
                                  U.165:   .BLKB    0
               802E   00326 ;TPA$TYPE
                                  U.376:   .WORD    -32722                                        ;
          00000000V   00328 ;TPA$ACTION
                                  U.377:   .LONG    <<BLANKS_ON-U.377>-4>                         ;
               85F6   0032C ;TPA$TYPE
                                  U.378:   .WORD    -31242                                        ;
          00000000V   0032E ;TPA$ACTION
                                  U.379:   .LONG    <<BLANKS_ON-U.379>-4>                         ;
               0054   00332 ;TPA$TYPE
                                  U.380:   .WORD    84                                            ;
               0074   00334 ;TPA$TYPE
                                  U.381:   .WORD    116                                           ;
               0046   00336 ;TPA$TYPE
                                  U.382:   .WORD    70                                            ;
               0466   00338 ;TPA$TYPE
                                  U.383:   .WORD    1126                                          ;
                      0033A LOGICAL1:
                                           .BLKB    0
               19F8   0033A ;TPA$TYPE
                                  U.384:   .WORD    6648                                          ;
               0000*  0033C ;TPA$SUBEXP
                                  U.386:   .WORD    <<U.385-U.386>-2>                             ;
               0000*  0033E ;TPA$TARGET
                                  U.387:   .WORD    <<LOGICAL1-U.387>-2>                          ;
               95F6   00340 ;TPA$TYPE
                                  U.388:   .WORD    -27146                                        ;
          00000000V   00342 ;TPA$ACTION
                                  U.389:   .LONG    <<BLANKS_OFF-U.389>-4>                        ;
               FFFF   00346 ;TPA$TARGET
                                  U.390:   .WORD    -1                                            ;
                      00348 ;LOGICAL2
                                  U.385:   .BLKB    0
          19F8  00348 ;TPA$TYPE
                      U.391:  .WORD   6648                                      ;
         0000*  0034A ;TPA$SUBEXP
                      U.392:  .WORD   <<U.3-U.392>-2>                           ;
          FFFE  0034C ;TPA$TARGET
                      U.393:  .WORD   -2                                        ;
          11F2  0034E ;TPA$TYPE
                      U.394:  .WORD   4594                                      ;
          FFFE  00350 ;TPA$TARGET
                      U.395:  .WORD   -2                                        ;
          102C  00352 ;TPA$TYPE
                      U.396:  .WORD   4140                                      ;
          FFFE  00354 ;TPA$TARGET
                      U.397:  .WORD   -2                                        ;
          1028  00356 ;TPA$TYPE
                      U.398:  .WORD   4136                                      ;
          FFFE  00358 ;TPA$TARGET
                      U.399:  .WORD   -2                                        ;
          103D  0035A ;TPA$TYPE
                      U.400:  .WORD   4157                                      ;
          FFFE  0035C ;TPA$TARGET
                      U.401:  .WORD   -2                                        ;
          1024  0035E ;TPA$TYPE
                      U.402:  .WORD   4132                                      ;
          FFFE  00360 ;TPA$TARGET
                      U.403:  .WORD   -2                                        ;
          1026  00362 ;TPA$TYPE
                      U.404:  .WORD   4134                                      ;
          FFFE  00364 ;TPA$TARGET
                      U.405:  .WORD   -2                                        ;
          15ED  00366 ;TPA$TYPE
                      U.406:  .WORD   5613                                      ;
          FFFF  00368 ;TPA$TARGET
                      U.407:  .WORD   -1                                        ;
                0036A ;COMPLEX
                      U.175:  .BLKB   0
          1428  0036A ;TPA$TYPE
                      U.408:  .WORD   5160                                      ;
         0000*  0036C ;TPA$TARGET
                      U.410:  .WORD   <<U.409-U.410>-2>                         ;
                0036E ;COMPLEX2
                      U.409:  .BLKB   0
          99F8  0036E ;TPA$TYPE
                      U.411:  .WORD   -26120                                    ;
         0000*  00370 ;TPA$SUBEXP
                      U.412:  .WORD   <<U.3-U.412>-2>                           ;
     00000000*  00372 ;TPA$ACTION
                      U.413:  .LONG   <<NEXT_RECORD-U.413>-4>                   ;
         0000*  00376 ;TPA$TARGET
                      U.414:  .WORD   <<U.409-U.414>-2>                         ;
          11F2  00378 ;TPA$TYPE
                      U.415:  .WORD   4594                                      ;
         0000*  0037A ;TPA$TARGET
                      U.416:  .WORD   <<U.409-U.416>-2>                         ;
          99F8  0037C ;TPA$TYPE
                      U.417:  .WORD   -26120                                    ;
         0000*  0037E ;TPA$SUBEXP
```

```
                                   U.418:  .WORD    <<U.170-U.418>-2>                                  ;
              00000000V 00380 ;TPA$ACTION
                                   U.419:  .LONG    <<STORE_COMPLEX-U.419>-4>                          ;
                  0000* 00384 ;TPA$TARGET
                                   U.421:  .WORD    <<U.420-U.421>-2>                                  ;
                  15F6  00386 ;TPA$TYPE
                                   U.422:  .WORD    5622                                               ;
                  0000* 00388 ;TPA$TARGET
                                   U.423:  .WORD    <<U.17-U.423>-2>                                   ;
                        0038A ;COMPLEX3
                                   U.420:  .BLKB    0
                  99F8  0038A ;TPA$TYPE
                                   U.424:  .WORD    -26120                                             ;
                  0000* 0038C ;TPA$SUBEXP
                                   U.425:  .WORD    <<U.3-U.425>-2>                                    ;
              00000000* 0038E ;TPA$ACTION
                                   U.426:  .LONG    <<NEXT_RECORD-U.426>-4>                            ;
                  0000* 00392 ;TPA$TARGET
                                   U.427:  .WORD    <<U.420-U.427>-2>                                  ;
                  11F2  00394 ;TPA$TYPE
                                   U.428:  .WORD    4594                                               ;
                  0000* 00396 ;TPA$TARGET
                                   U.429:  .WORD    <<U.420-U.429>-2>                                  ;
                  102C  00398 ;TPA$TYPE
                                   U.430:  .WORD    4140                                               ;
                  0000* 0039A ;TPA$TARGET
                                   U.432:  .WORD    <<U.431-U.432>-2>                                  ;
                  15F6  0039C ;TPA$TYPE
                                   U.433:  .WORD    5622                                               ;
                  0000* 0039E ;TPA$TARGET
                                   U.434:  .WORD    <<U.17-U.434>-2>                                   ;
                        003A0 ;COMPLEX4
                                   U.431:  .BLKB    0
                  99F8  003A0 ;TPA$TYPE
                                   U.435:  .WORD    -26120                                             ;
                  0000* 003A2 ;TPA$SUBEXP
                                   U.436:  .WORD    <<U.3-U.436>-2>                                    ;
              00000000* 003A4 ;TPA$ACTION
                                   U.437:  .LONG    <<NEXT_RECORD-U.437>-4>                            ;
                  0000* 003A8 ;TPA$TARGET
                                   U.438:  .WORD    <<U.431-U.438>-2>                                  ;
                  11F2  003AA ;TPA$TYPE
                                   U.439:  .WORD    4594                                               ;
                  0000* 003AC ;TPA$TARGET
                                   U.440:  .WORD    <<U.431-U.440>-2>                                  ;
                  99F8  003AE ;TPA$TYPE
                                   U.441:  .WORD    -26120                                             ;
                  0000* 003B0 ;TPA$SUBEXP
                                   U.442:  .WORD    <<U.170-U.442>-2>                                  ;
              00000000V 003B2 ;TPA$ACTION
                                   U.443:  .LONG    <<STORE_COMPLEX-U.443>-4>                          ;
                  0000* 003B6 ;TPA$TARGET
                                   U.445:  .WORD    <<U.444-U.445>-2>                                  ;
                  15F6  003B8 ;TPA$TYPE
                                   U.446:  .WORD    5622                                               ;
                  0000* 003BA ;TPA$TARGET
                                   U.447:  .WORD    <<U.17-U.447>-2>                                   ;
```

```
                003BC ;COMPLEX5
                      U.444:  .BLKB    0
           99F8 003BC ;TPA$TYPE
                      U.448:  .WORD    -26120                                ;
          0000* 003BE ;TPA$SUBEXP
                      U.449:  .WORD    <<U.3-U.449>-2>                        ;
      00000000* 003C0 ;TPA$ACTION
                      U.450:  .LONG    <<NEXT_RECORD-U.450>-4>                ;
          0000* 003C4 ;TPA$TARGET
                      U.451:  .WORD    <<U.444-U.451>-2>                      ;
           11F2 003C6 ;TPA$TYPE
                      U.452:  .WORD    4594                                   ;
          0000* 003C8 ;TPA$TARGET
                      U.453:  .WORD    <<U.444-U.453>-2>                      ;
           1029 003CA ;TPA$TYPE
                      U.454:  .WORD    4137                                   ;
           FFFF 003CC ;TPA$TARGET
                      U.455:  .WORD    -1                                     ;
           15F6 003CE ;TPA$TYPE
                      U.456:  .WORD    5622                                   ;
          0000* 003D0 ;TPA$TARGET
                      U.457:  .WORD    <<U.17-U.457>-2>                       ;
                003D2 ;CHARACTER
                      U.179:  .BLKB    0
           9427 003D2 ;TPA$TYPE
                      U.458:  .WORD    -27609                                 ;
      00000000V 003D4 ;TPA$ACTION
                      U.459:  .LONG    <<STRING_OK-U.459>-4>                  ;
          0000* 003D8 ;TPA$TARGET
                      U.461:  .WORD    <<U.460-U.461>-2>                      ;
                003DA ;CHARACTER1
                      U.460:  .BLKB    0
           91F7 003DA ;TPA$TYPE
                      U.462:  .WORD    -28169                                 ;
      00000000* 003DC ;TPA$ACTION
                      U.463:  .LONG    <<NEXT_RECORD-U.463>-4>                ;
          0000* 003E0 ;TPA$TARGET
                      U.464:  .WORD    <<U.460-U.464>-2>                      ;
           1027 003E2 ;TPA$TYPE
                      U.465:  .WORD    4135                                   ;
          0000* 003E4 ;TPA$TARGET
                      U.467:  .WORD    <<U.466-U.467>-2>                      ;
           95ED 003E6 ;TPA$TYPE
                      U.468:  .WORD    -27155                                 ;
      00000000V 003E8 ;TPA$ACTION
                      U.469:  .LONG    <<STORE_CHARACTER-U.469>-4>            ;
          0000* 003EC ;TPA$TARGET
                      U.470:  .WORD    <<U.460-U.470>-2>                      ;
                003EE ;NEXT_QUOTE
                      U.466:  .BLKB    0
           91F7 003EE ;TPA$TYPE
                      U.471:  .WORD    -28169                                 ;
      00000000* 003F0 ;TPA$ACTION
                      U.472:  .LONG    <<NEXT_RECORD-U.472>-4>                ;
          0000* 003F4 ;TPA$TARGET
                      U.473:  .WORD    <<U.466-U.473>-2>                      ;
           9027 003F6 ;TPA$TYPE
```

```
                                             U.474:  .WORD    -28633                                                ;
                                00000000V 003F8 ;TPA$ACTION
                                             U.475:  .LONG    <<STORE_CHARACTER-U.475>-4>                           ;
                                    0000* 003FC ;TPA$TARGET
                                             U.476:  .WORD    <<U.460-U.476>-2>                                     ;
                                     15F6 003FE ;TPA$TYPE
                                             U.477:  .WORD    5622                                                  ;
                                     FFFF 00400 ;TPA$TARGET
                                             U.478:  .WORD    -1                                                    ;
                                          00402 ;ERROR_STATE
                                             U.17:   .BLKB    0
                                     91ED 00402 ;TPA$TYPE
                                             U.479:  .WORD    -28179                                                ;
                                00000000V 00404 ;TPA$ACTION
                                             U.480:  .LONG    <<SYNTAX_ERROR-U.480>-4>                              ;
                                     FFFE 00408 ;TPA$TARGET
                                             U.481:  .WORD    -2                                                    ;
                                     95F6 0040A ;TPA$TYPE
                                             U.482:  .WORD    -27146                                                ;
                                00000000V 0040C ;TPA$ACTION
                                             U.483:  .LONG    <<SYNTAX_ERROR-U.483>-4>                              ;
                                     FFFE 00410 ;TPA$TARGET
                                             U.484:  .WORD    -2                                                    ;
                                          00412 ;INVREFVAR_STATE
                                             U.215:  .BLKB    0
                                     95F6 00412 ;TPA$TYPE
                                             U.485:  .WORD    -27146                                                ;
                                00000000V 00414 ;TPA$ACTION
                                             U.486:  .LONG    <<INVREFVAR_ERROR-U.486>-4>                           ;
                                     FFFE 00418 ;TPA$TARGET
                                             U.487:  .WORD    -2                                                    ;

                                                     .PSECT   _LIB$KEY0$,NOWRT,  SHR,  PIC,1

                                          00000 FOR$$A_NMLKEYWD::
                                                     .BLKB    0
                                          00000 ;TPA$KEY0
                                             U.1:    .BLKB    0

                                                     .EXTRN   FOR$$CVT_TYPE, FOR$$DO_NML_OUTPUT
                                                     .EXTRN   FOR$$REC_RSNO, FOR$$REC_WSNO
                                                     .EXTRN   FOR$$SIGNAL, FOR$$SIGNAL_STO
                                                     .EXTRN   OTS$CVT_TI_L, OTS$CVT_TL_L
                                                     .EXTRN   OTS$CVT_T_F, OTS$CVT_T_D
                                                     .EXTRN   OTS$CVT_T_G, OTS$CVT_T_H
                                                     .EXTRN   LIB$SIG_TO_RET

                                                     .PSECT   _FOR$CODE,NOWRT,  SHR,  PIC,2

                                     083C 00000 NEXT_RECORD:
                                                     .WORD    Save R2,R3,R4,R5,R11                                  ; 0752
                  5B        40    AC   D0 00002      MOVL     64(AP), CCB                                           ; 0798
                   00000000G   00   16 00006 1$:     JSB      FOR$$REC_RSNO                                         ; 0801
                            B0    AB   D6 0000C      INCL     -80(CCB)                                              ; 0802
            0C    AC        B0    AB   D0 0000F      MOVL     -80(CCB), 12(AP)                                      ; 0803
08   AC     B4    AB        B0    AB   C3 00014      SUBL3    -80(CCB), -76(CCB), 8(AP)                             ; 0804
                                  E9   15 0001B      BLEQ     1$                                                    ; 0806
```

```
                          50           01  D0 0001D          MOVL    #1, R0                                            ; 0807
                                           04 00020          RET                                                       ; 0809

; Routine Size:  33 bytes,    Routine Base:  _FOR$CODE + 0000
```

```
1 %SBTTL 'INIT_SUBS - Start a subscript/substring '
1 ROUTINE INIT_SUBS =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       LIB$TPARSE action routine which initiates the evaluation of a subscript
1 !       or substring.  If the current variable can not have a subscript or
1 !       a substring, an error routine is called.
1 !
1 ! CALLING SEQUENCE:
1 !
1 !       status = INIT_SUBS ()
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       AP      Points to PARAM_BLOCK
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       PARAM_BLOCK [NML$L_CURIDX] = 0
1 !
1 ! COMPLETION STATUS:
1 !
1 !       1 for success
1 !
1 ! SIDE EFFECTS:
1 !
1 !       Can call INVREFVAR_ERROR
1 !
1 !--
1
2     BEGIN
2
2     BUILTIN
2         AP;                 ! Argument pointer points to parameter block
2
2     MAP
2         AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
2
2     LOCAL
2         DESCR: REF BLOCK [, BYTE];
2
2     DESCR = .AP [NML$A_DESCR];  ! Get descriptor address
2
2     !+
2     ! If this variable is not an array or a string, signal FOR$_INVREFVAR
2     !-
2
3     IF ((.DESCR [DSC$B_CLASS] EQL DSC$K_CLASS_A) OR
3             (.DESCR [DSC$B_DTYPE] EQL DSC$K_DTYPE_T))
2     THEN
2         AP [NML$L_CURIDX] = 0   ! Set up for start of subscript/substring
```

```
;  807          0867  2       ELSE
;  808          0868  2           CALLG (.AP, INVREFVAR_ERROR);
;  809          0869  2
;  810          0870  2       RETURN 1;
;  811          0871  2
;  812          0872  1       END;



                                                0000 00000 INIT_SUBS:
                                                                  .WORD    Save nothing                              ; 0811
                          50        3C   AC   D0 00002           MOVL     60(AP), DESCR                             ; 0857
                          04        03   A0   91 00006           CMPB     3(DESCR), #4                              ; 0863
                                         06   13 0000A           BEQL     1$                                        ;
                          0E        02   A0   91 0000C           CMPB     2(DESCR), #14                             ; 0864
                                         05   12 00010           BNEQ     2$                                        ;
                                    48   AC   D4 00012 1$:       CLRL     72(AP)                                    ; 0866
                                         05   11 00015           BRB      3$                                        ;
                    0000V   CF           6C   FA 00017 2$:       CALLG    (AP), INVREFVAR_ERROR                     ; 0868
                            50           01   D0 0001C 3$:       MOVL     #1, R0                                    ; 0870
                                              04 0001F           RET                                                ; 0872

; Routine Size:  32 bytes,    Routine Base:  _FOR$CODE + 0021


;  813          0873  1 !<BLF/PAGE>
```

```
1 %SBTTL 'SUBSTRING_COLON - Mark presence of colon in substring'
1 ROUTINE SUBSTRING_COLON =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       LIB$TPARSE action routine which is called when a colon is found in
1 !       a substring.  If no left part has been found, it sets the left part
1 !       to 1 indicating that the low column was omitted.  If the current
1 !       variable is not of type CHARACTER, then an error routine is called.
1 !       If the variable is an array, a subscript must have been previously
1 !       processed, otherwise an error is given.
1 !
1 ! CALLING SEQUENCE:
1 !
1 !       status = SUBSTRING_COLON ()
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       AP      Points to PARAM_BLOCK
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       If NML$L_CURIDX = 0 then NML$L_CURIDX = 1 and NML$L_SUBSCR[0] = 1
1 !
1 ! COMPLETION STATUS:
1 !
1 !       1
1 !
1 ! SIDE EFFECTS:
1 !
1 !       NONE
1 !
1 !--
1
2   BEGIN
2
2   LOCAL
2       DESCR: REF BLOCK [, BYTE];        ! Address of variable descriptor
2
2   BUILTIN
2       AP;             ! Argument pointer points to parameter block
2
2   MAP
2       AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
2
2   IF .AP [NML$B_DTYPE] NEQ DSC$K_DTYPE_T
2   THEN
2       CALLG (.AP, INVREFVAR_ERROR);   ! Substring not allowed with non-CHARACTER
2
2   !+
2   ! If this variable is an array, then a subscript must have been previously
2   ! seen for a substring to be valid.
```

```
;  872       0931  2      !-
;  873       0932  2
;  874       0933  2      DESCR = .AP [NML$A_DESCR];
;  875       0934  2      IF .DESCR [DSC$B_CLASS] EQL DSC$K_CLASS_A AND NOT .AP [NML$V_SUBSCRIPT]
;  876       0935  2      THEN
;  877       0936  2          CALLG (.AP, INVREFVAR_ERROR);   ! Substring not allowed with unsubscripted array
;  878       0937  2
;  879       0938  2      IF .AP [NML$L_CURIDX] EQL 0 ! Substring of the form (:n)?
;  880       0939  2      THEN
;  881       0940  3          BEGIN
;  882       0941  3          AP [NML$L_CURIDX] = 1;  ! Left bound is first character
;  883       0942  3          AP [NML$L_SUBSCR] = 1;
;  884       0943  2          END;
;  885       0944  2
;  886       0945  2      AP [NML$V_SUBSTRING] = 1;    ! Indicate substring
;  887       0946  2
;  888       0947  2      RETURN 1;
;  889       0948  2
;  890       0949  1      END;



                                             0000 00000 SUBSTRING_COLON:
                                                            .WORD   Save nothing                                 ; 0875
                 0E          44     AC    91 00002          CMPB    68(AP), #14                                  ; 0924
                                    05    13 00006          BEQL    1$                                           ;
            0000V  CF               6C    FA 00008          CALLG   (AP), INVREFVAR_ERROR                        ; 0926
                 50          3C     AC    D0 0000D 1$:      MOVL    60(AP), DESCR                                ; 0933
                 04          03     A0    91 00011          CMPB    3(DESCR), #4                                 ; 0934
                                    0A    12 00015          BNEQ    2$                                           ;
       05      45  AC               03    E0 00017          BBS     #3, 69(AP), 2$                               ;
            0000V  CF               6C    FA 0001C          CALLG   (AP), INVREFVAR_ERROR                        ; 0936
                             48     AC    D5 00021 2$:      TSTL    72(AP)                                       ; 0938
                                    08    12 00024          BNEQ    3$                                           ;
              48   AC               01    D0 00026          MOVL    #1, 72(AP)                                   ; 0941
              4C   AC               01    D0 0002A          MOVL    #1, 76(AP)                                   ; 0942
              45   AC               01    88 0002E 3$:      BISB2   #1, 69(AP)                                   ; 0945
                   50               01    D0 00032          MOVL    #1, R0                                       ; 0947
                                          04 00035          RET                                                  ; 0949

; Routine Size:  54 bytes,    Routine Base:  _FOR$CODE + 0041


;  891       0950  1 !<BLF/PAGE>
```

```
1 %SBTTL 'STORE_SUBS - Store a subscript or substring'
1 ROUTINE STORE_SUBS =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       LIB$TPARSE action routine which stores the value of a subscript or
1 !       substring column.  It also checks to see if the allowed number of
1 !       subscripts have not been exceeded.
1 !
1 ! CALLING SEQUENCE:
1 !
1 !       status = STORE_SUBS ()
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       AP      Points to PARAM_BLOCK
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       PARAM_BLOCK [NML$L_CURIDX] is incremented by 1
1 !       The value of the subscript is stored in the current subscript vector
1 !       location.
1 !
1 ! COMPLETION STATUS:
1 !
1 !       1 for success
1 !
1 ! SIDE EFFECTS:
1 !
1 !       May call SYNTAX_ERROR
1 !       May call INVREFVAR_ERROR
1 !--
1
2     BEGIN
2
2     BUILTIN
2         AP;               ! Argument pointer points to parameter block
2
2     MAP
2         AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
2
2     LOCAL
2         SUBSCRIPTS: REF VECTOR [, LONG],
2         DESCR: REF BLOCK [, BYTE];
2
2     SUBSCRIPTS = AP [NML$L_SUBSCR];       ! Address of subscript vector
2
2     IF .AP [NML$V_SUBSTRING]
2     THEN
3         BEGIN
3         IF .AP [NML$L_CURIDX] GTR 1      ! Only two substring values allowed!
```

```
;  950          1008  3             THEN
;  951          1009  3                 CALLG (.AP, SYNTAX_ERROR);
;  952          1010  3             IF .AP [TPA$L_NUMBER] LEQ 0     ! Substring column can't be LEQ 0
;  953          1011  3             THEN
;  954          1012  3                 CALLG (.AP, INVREFVAR_ERROR);
;  955          1013  3             END
;  956          1014  2         ELSE
;  957          1015  3             BEGIN
;  958          1016  3             DESCR = .AP [NML$A_DESCR];          ! Get descriptor address
;  959          1017  3             IF .DESCR [DSC$B_CLASS] EQL DSC$K_CLASS_A
;  960          1018  3             THEN
;  961          1019  3                 IF .AP [NML$L_CURIDX] GEQ .DESCR [DSC$B_DIMCT]
;  962          1020  3                 THEN
;  963          1021  3                     CALLG (.AP, INVREFVAR_ERROR);   ! Too many subscripts
;  964          1022  2             END;
;  965          1023  2
;  966          1024  2         SUBSCRIPTS [.AP [NML$L_CURIDX]] = .AP [TPA$L_NUMBER];         ! Store subscript
;  967          1025  2         AP [NML$L_CURIDX] = .AP [NML$L_CURIDX] + 1;
;  968          1026  2
;  969          1027  2         RETURN 1;
;  970          1028  2
;  971          1029  1         END;



                                                   0004 00000 STORE_SUBS:
                                                                      .WORD    Save R2                                    ; 0952
                              52        4C    AC   9E 00002           MOVAB    76(AP), SUBSCRIPTS                         ; 1002
                              10        45    AC   E9 00006           BLBC     69(AP), 2$                                 ; 1004
                              01        48    AC   D1 0000A           CMPL     72(AP), #1                                 ; 1007
                                              05   15 0000E           BLEQ     1$                                         ;
                       0000V  CF              6C   FA 00010           CALLG    (AP), SYNTAX_ERROR                         ; 1009
                                        1C    AC   D5 00015 1$:       TSTL     28(AP)                                     ; 1010
                                              11   11 00018           BRB      3$                                         ;
                              50        3C    AC   D0 0001A 2$:       MOVL     60(AP), DESCR                              ; 1016
                              04        03    A0   91 0001E           CMPB     3(DESCR), #4                               ; 1017
                                              0E   12 00022           BNEQ     4$                                         ;
      48    AC       0B    A0         08            00   ED 00024           CMPZV    #0, #8, 11(DESCR), 72(AP)                  ; 1019
                                              05   14 0002B 3$:       BGTR     4$                                         ;
                       0000V  CF              6C   FA 0002D           CALLG    (AP), INVREFVAR_ERROR                      ; 1021
                              50        48    AC   D0 00032 4$:       MOVL     72(AP), R0                                 ; 1024
                            6240        1C    AC   D0 00036           MOVL     28(AP), (SUBSCRIPTS)[R0]                   ;
                                        48    AC   D6 0003B           INCL     72(AP)                                     ; 1025
                              50        01         D0 0003E           MOVL     #1, R0                                     ; 1027
                                                   04 00041           RET                                                 ; 1029

; Routine Size:  66 bytes,    Routine Base:  _FOR$CODE + 0077


;  972          1030  1 !<BLF/PAGE>
```

```
1 %SBTTL 'END_SUBSCRIPT - End an array subscript'
1 ROUTINE END_SUBSCRIPT =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       LIB$TPARSE action routine which is called at the end of an array subscript.
1 !       It calls COMPUTE_INDEX to calculate the starting position in the array.
1 !
1 ! CALLING SEQUENCE:
1 !
1 !       status = END_SUBSCRIPT ()
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       AP      Points to PARAM_BLOCK
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       See COMPUTE_INDEX
1 !       NML$V_SUBSCRIPT = 1, to indicate subscript processed.
1 !
1 ! COMPLETION STATUS:
1 !
1 !       1 for success
1 !
1 ! SIDE EFFECTS:
1 !
1 !       Signals FOR$_INVREFVAR if a subscript is out of bounds.
1 !
1 !--
1
2     BEGIN
2
2     BUILTIN
2         AP;                 ! Argument pointer points to parameter block
2
2     MAP
2         AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
2
3     IF NOT (CALLG (.AP, COMPUTE_INDEX))
2     THEN
2         CALLG (.AP, INVREFVAR_ERROR);
2
2     AP [NML$V_SUBSCRIPT] = 1;    ! Allows substring to follow for arrays
2
2     RETURN 1;
2
1     END;
```

```
                                            0000 00000 END_SUBSCRIPT:
                                                              .WORD   Save nothing                              ; 1032
                    0000V  CF           6C  FA 00002          CALLG   (AP), COMPUTE_INDEX                       ; 1075
                           05           50  E8 00007          BLBS    R0, 1$                                    ;
                    0000V  CF           6C  FA 0000A          CALLG   (AP), INVREFVAR_ERROR                     ; 1077
                       45  AC           08  88 0000F 1$:      BISB2   #8, 69(AP)                                ; 1079
                           50           01  D0 00013          MOVL    #1, R0                                    ; 1081
                                            04 00016          RET                                               ; 1083

; Routine Size:  23 bytes,    Routine Base:  _FOR$CODE + 00B9


; 1027          1084  1 !<BLF/PAGE>
```

```
1 %SBTTL 'COMPUTE_INDEX - Compute the array index'
1 ROUTINE COMPUTE_INDEX =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       Routine which computes the starting location for the current
1 !       variable based on the array subscripts seen.
1 !
1 ! CALLING SEQUENCE:
1 !
1 !       status = COMPUTE_INDEX ()
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       AP      Points to PARAM_BLOCK
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       PARAM_BLOCK [NML$A_VARCUR] = Starting address
1 !       PARAM_BLOCK [NML$A_VARSTART] = Starting address
1 !
1 ! COMPLETION STATUS:
1 !
1 !       1 for success
1 !       SS$_SUBRNG for subscript out of range
1 !
1 ! SIDE EFFECTS:
1 !
1 !       NONE
1 !
1 !--
1
2     BEGIN
2
2     BUILTIN
2         AP;                 ! Argument pointer points to parameter block
2
2     MAP
2         AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
2
2     LOCAL
2         DESCR: REF BLOCK [, BYTE],          ! Variable descriptor
2         MULTIPLIERS: REF VECTOR [,LONG],    ! Multiplier array
2         LAST_MULT,                          ! Previous bounds' multiplier
2         BOUNDS: REF VECTOR [,LONG],         ! Current bounds
2         SUBSCRIPT: REF VECTOR [,LONG],      ! Current subscript
2         DIMENSION,                          ! Current dimension
2         OFFSET;                             ! Offset into array
2
2     ENABLE
2         LIB$SIG_TO_RET; ! Return SS$_SUBRNG as a status
2
```

```
2       DESCR = .AP [NML$A_DESCR];              ! Get descriptor address
2
2       !+
2       ! If the descriptor class is not ARRAY, then a subscript is illegal.
2       !-
2
2       IF .DESCR [DSC$B_CLASS] NEQ DSC$K_CLASS_A
2       THEN
2           RETURN 0;
2
2       !+
2       ! If the number of subscripts doesn't match the number of dimensions, then
2       ! it is an error.
2       !-
2
2       IF .DESCR [DSC$B_DIMCT] NEQ .AP [NML$L_CURIDX]
2       THEN
2           RETURN 0;           ! Number of subscripts don't match
2
2       DIMENSION = .AP [NML$L_CURIDX] - 1;
2       SUBSCRIPT = AP [NML$L_SUBSCR] + (4 * .DIMENSION);
2       MULTIPLIERS = DESCR [DSC$L_M1] + (4 * .DIMENSION) - 4;
2       LAST_MULT = .MULTIPLIERS [0];
2       BOUNDS = MULTIPLIERS [2] + (8 * .DIMENSION);
2       OFFSET = 0;
2
2       !+
2       ! For each dimension, from last to first, compute the offset into the
2       ! array.  If a subscript is out of bounds, the INDEX instruction will
2       ! signal an error.
2       !-
2
2       DECR DIM FROM .DIMENSION TO 0 DO
3           BEGIN
3           IF .DIM EQL 0
3           THEN
3               LAST_MULT = 1;
3           INDEX (SUBSCRIPT [0], BOUNDS [0], BOUNDS [1], LAST_MULT,
3                   OFFSET, OFFSET);
3           MULTIPLIERS = MULTIPLIERS [-1];
3           LAST_MULT = .MULTIPLIERS [0];
3           BOUNDS = BOUNDS [-2];
3           SUBSCRIPT = SUBSCRIPT [-1];
2           END;
2
2       AP [NML$A_VARCUR] = .DESCR [DSC$A_A0] + (.OFFSET * .AP [NML$W_STRIDE]);
2       AP [NML$A_VARSTART] = .AP [NML$A_VARCUR];
2
2       RETURN 1;
2
1       END;




                                        007C 00000 COMPUTE_INDEX:
```

```
                                                          .WORD   Save R2,R3,R4,R5,R6                              ; 1086
                        6D       0063   CF  DE 00002      MOVAL   5$, (FP)                                         ; 1122
                        53         3C   AC  D0 00007      MOVL    60(AP), DESCR                                    ; 1142
                        04         03   A3  91 0000B      CMPB    3(DESCR), #4                                     ; 1148
                                        55  12 0000F      BNEQ    4$                                               ;
     48   AC      0B   A3       08      00  ED 00011      CMPZV   #0, #8, 11(DESCR), 72(AP)                        ; 1157
                                        4C  12 00018      BNEQ    4$                                               ;
                       50      48   AC  01  C3 0001A      SUBL3   #1, 72(AP), DIMENSION                            ; 1161
                                    56   4C AC40  DE 0001F      MOVAL   76(AP)[DIMENSION], SUBSCRIPT                     ; 1162
                                    54   10 A340  DE 00024      MOVAL   16(DESCR)[DIMENSION], MULTIPLIERS                ; 1163
                                    55      64  D0 00029      MOVL    (MULTIPLIERS), LAST_MULT                         ; 1164
                                    52   08 A440  7E 0002C      MOVAQ   8(MULTIPLIERS)[DIMENSION], BOUNDS                ; 1165
                                            51  D4 00031      CLRL    OFFSET                                           ; 1166
                                            50  D6 00033      INCL    DIM                                              ; 1174
                                            16  11 00035      BRB     3$                                               ;
                                            03  12 00037 1$:  BNEQ    2$                                               ; 1176
                                    55      01  D0 00039      MOVL    #1, LAST_MULT                                    ; 1178
          55      04   A2           62      66  0A 0003C 2$:  INDEX   (SUBSCRIPT), (BOUNDS), 4(BOUNDS), -              ; 1179
                                    51      51     00042              LAST_MULT, OFFSET, OFFSET                        ;
                                    55      74  D0 00044      MOVL    -(MULTIPLIERS), LAST_MULT                        ; 1182
                                    52      08  C2 00047      SUBL2   #8, BOUNDS                                       ; 1183
                                    56      04  C2 0004A      SUBL2   #4, SUBSCRIPT                                    ; 1184
                                    E7      50  F4 0004D 3$:  SOBGEQ  DIM, 1$                                          ; 1174
                                    50   3A AC  3C 00050      MOVZWL  58(AP), R0                                       ; 1187
                                    51      50  C4 00054      MULL2   R0, R1                                           ;
                            34   AC  10 B341  9E 00057      MOVAB   @16(DESCR)[R1], 52(AP)                           ;
                            2C   AC   34  AC  D0 0005D      MOVL    52(AP), 44(AP)                                   ; 1188
                                    50      01  D0 00062      MOVL    #1, R0                                           ; 1190
                                                04 00065      RET                                                      ;
                                            50  D4 00066 4$:  CLRL    R0                                               ; 1192
                                                04 00068      RET                                                      ;
                                              0000 00069 5$:  .WORD   Save nothing                                     ; 1122
                                            7E  D4 0006B      CLRL    -(SP)                                            ;
                                            5E  DD 0006D      PUSHL   SP                                               ;
                                    7E   04 AC  7D 0006F      MOVQ    4(AP), -(SP)                                     ;
                         00000000G  00      03  FB 00073      CALLS   #3, LIB$SIG_TO_RET                               ;
                                                04 0007A      RET                                                      ;

; Routine Size:  123 bytes,    Routine Base:  _FOR$CODE + 00D0


; 1137         1193  1 !<BLF/PAGE>
```

```
%SBTTL 'END_SUBSTRING - End a substring'
ROUTINE END_SUBSTRING =

!++
! FUNCTIONAL DESCRIPTION:
!
!       LIB$TPARSE action routine which evaluates a substring reference.
!
! CALLING SEQUENCE:
!
!       status = END_SUBSTRING ()
!
! FORMAL PARAMETERS:
!
!       NONE
!
! IMPLICIT INPUTS:
!
!       AP      Points to PARAM_BLOCK
!
! IMPLICIT OUTPUTS:
!
!       PARAM_BLOCK [NML$A_VARCUR] - Set to starting point
!       PARAM_BLOCK [NML$W_VARSIZE] - Set to string size
!       PARAM_BLOCK [NML$A_VARSTART] - Set to starting point
!
! COMPLETION STATUS:
!
!       1 for success
!
! SIDE EFFECTS:
!
!       Can call INVREFVAR_ERROR if the substring is out-of-bounds.
!
!--

    BEGIN

    BUILTIN
        AP;                     ! Argument pointer points to parameter block

    MAP
        AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);

    IF .AP [NML$L_CURIDX] EQL 1
    THEN
        AP [NML$L_SUBSTRHI] = .AP [NML$W_VARSIZE]
    ELSE IF .AP [NML$L_CURIDX] NEQ 2
    THEN
        CALLG (.AP, SYNTAX_ERROR);

    IF .AP [NML$L_SUBSTRLO] LEQ 0 OR .AP [NML$L_SUBSTRHI] LSS .AP [NML$L_SUBSTRLO] OR
        .AP [NML$L_SUBSTRHI] GTR .AP [NML$W_VARSIZE]
    THEN
        CALLG (.AP, INVREFVAR_ERROR);

    AP [NML$A_VARCUR] = .AP [NML$A_VARCUR] + .AP [NML$L_SUBSTRLO] - 1;
```

```
; 1196          1251  2       AP [NML$A_VARSTART] = .AP [NML$A_VARCUR];
; 1197          1252  2       AP [NML$W_VARSIZE] = (.AP [NML$L_SUBSTRHI] - .AP [NML$L_SUBSTRLO]) + 1;
; 1198          1253  2
; 1199          1254  2       RETURN 1;
; 1200          1255  2
; 1201          1256  1       END;



                                                   0000 00000 END_SUBSTRING:
                                                                           .WORD   Save nothing                                      ; 1195
                                 01        48    AC  D1 00002              CMPL    72(AP), #1                                        ; 1238
                                                 07  12 00006              BNEQ    1$                                                ;
                            50   AC        38    AC  3C 00008              MOVZWL  56(AP), 80(AP)                                    ; 1240
                                                 0B  11 0000D              BRB     2$                                                ;
                                 02        48    AC  D1 0000F 1$:          CMPL    72(AP), #2                                        ; 1241
                                                 05  13 00013              BEQL    2$                                                ;
                         0000V   CF              6C  FA 00015              CALLG   (AP), SYNTAX_ERROR                                ; 1243
                                           4C    AC  D5 0001A 2$:          TSTL    76(AP)                                            ; 1245
                                                 10  15 0001D              BLEQ    3$                                                ;
                            4C   AC        50    AC  D1 0001F              CMPL    80(AP), 76(AP)                                    ;
                                                 09  19 00024              BLSS    3$                                                ;
      50   AC        38   AC          10         00  ED 00026              CMPZV   #0, #16, 56(AP), 80(AP)                           ; 1246
                                                 05  18 0002D              BGEQ    4$                                                ;
                         0000V   CF              6C  FA 0002F 3$:          CALLG   (AP), INVREFVAR_ERROR                             ; 1248
                      50    34   AC        4C    AC  C1 00034 4$:          ADDL3   76(AP), 52(AP), R0                                ; 1250
                            34   AC        FF    A0  9E 0003A              MOVAB   -1(R0), 52(AP)                                    ;
                            2C   AC        34    AC  D0 0003F              MOVL    52(AP), 44(AP)                                    ; 1251
                      50    50   AC        4C    AC  C3 00044              SUBL3   76(AP), 80(AP), R0                                ; 1252
                 38   AC         50              01  A1 0004A              ADDW3   #1, R0, 56(AP)                                    ;
                                 50              01  D0 0004F              MOVL    #1, R0                                            ; 1254
                                                     04 00052              RET                                                       ; 1256

; Routine Size:  83 bytes,    Routine Base:  _FOR$CODE + 014B


; 1202          1257  1 !<BLF/PAGE>
```

```
 1 %SBTTL 'CONVERT_INTEGER - Convert a decimal integer'
 1 ROUTINE CONVERT_INTEGER =
 1
 1 !++
 1 ! FUNCTIONAL DESCRIPTION:
 1 !
 1 !        LIB$TPARSE action routine which converts the current token to a
 1 !        longword integer which is stored in TPA$L_NUMBER.  If the conversion
 1 !        fails, an error is signalled.
 1 !
 1 ! CALLING SEQUENCE:
 1 !
 1 !        status = CONVERT_INTEGER ()
 1 !
 1 ! FORMAL PARAMETERS:
 1 !
 1 !        NONE
 1 !
 1 ! IMPLICIT INPUTS:
 1 !
 1 !        AP       Points to PARAM_BLOCK
 1 !
 1 ! IMPLICIT OUTPUTS:
 1 !
 1 !        TPA$L_NUMBER gets the binary value of the integer token
 1 !
 1 ! COMPLETION STATUS:
 1 !
 1 !        SS$_NORMAL if success
 1 !
 1 ! SIDE EFFECTS:
 1 !
 1 !        May signal FOR$_INPCONERR, input conversion error
 1 !
 1 !--
 1
 2    BEGIN
 2
 2    BUILTIN
 2        AP;             ! Argument pointer points to parameter block
 2
 2    MAP
 2        AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
 2
 2    IF NOT OTS$CVT_TI_L (AP [TPA$L_TOKENCNT], AP [TPA$L_NUMBER])
 2    THEN
 2        CALLG (.AP, INPCONERR_ERROR);
 2
 2    RETURN 1;
 2
 1    END;



                                  0000 00000 CONVERT_INTEGER:
```

```
                                                              .WORD    Save nothing                                  ; 1259
                              1C    AC  9F 00002              PUSHAB   28(AP)                                        ; 1302
                              10    AC  9F 00005              PUSHAB   16(AP)                                        ;
              00000000G  00              02  FB 00008              CALLS    #2, OTS$CVT_TI_L                              ;
                         05              50  E8 0000F              BLBS     R0, 1$                                        ;
                  0000V  CF              6C  FA 00012              CALLG    (AP), INPCONERR_ERROR                         ; 1304
                         50              01  D0 00017 1$:          MOVL     #1, R0                                        ; 1306
                                         04  0001A                 RET                                                    ; 1308

; Routine Size:  27 bytes,    Routine Base:  _FOR$CODE + 019E


; 1255          1309  1 !<BLF/PAGE>
```

```
1 %SBTTL 'STRING_OK - Is a string value ok?'
1 ROUTINE STRING_OK =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       LIB$TPARSE action routine which returns success if the current variable
1 !       datatype is CHARACTER.  It also sets TPA$V_BLANKS if successful.
1 !       If the datatype is not CHARACTER, INPCONERR is signalled.
1 !
1 ! CALLING SEQUENCE:
1 !
1 !       status = STRING_OK ()
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       AP      Points to PARAM_BLOCK
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       PARAM_BLOCK [TPA$V_BLANKS] = 1 if successful
1 !
1 ! COMPLETION STATUS:
1 !
1 !       1 - success
1 !
1 ! SIDE EFFECTS:
1 !
1 !       May signal FOR$_INPCONERR, input conversion error
1 !
1 !--
1
2   BEGIN
2
2   BUILTIN
2       AP;                     ! Argument pointer points to parameter block
2
2   MAP
2       AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
2
2   IF .AP [NML$B_DTYPE] NEQ DSC$K_DTYPE_T
2   THEN
2       CALLG (.AP, INPCONERR_ERROR);   ! Input conversion error
2
2   IF .AP [NML$A_VARSTART] GEQA .AP [NML$A_VAREND]
2   THEN
2       FOR$$SIGNAL_STO (FOR$K_TOOMANVAL, .AP [NML$A_VARNAME]);
2
2   AP [TPA$V_BLANKS] = 1;
2   AP [NML$B_CONSTYPE] = K_CHARACTER;
2   AP [NML$L_CONSBLOCK] = .AP [NML$A_VARSTART];
2   RETURN 1;
2
```

```
; 1314          1367  1      END;



                                              0000 00000 STRING_OK:
                                                                        .WORD   Save nothing                                      ; 1311
                              0E        44    AC  91 00002              CMPB    68(AP), #14                                       ; 1354
                                              05  13 00006              BEQL    1$                                                ;
                          0000V CF            6C  FA 00008              CALLG   (AP), INPCONERR_ERROR                             ; 1356
                             30 AC      2C    AC  D1 0000D 1$:          CMPL    44(AP), 48(AP)                                    ; 1358
                                              0C  1F 00012              BLSSU   2$                                                ;
                                        28    AC  DD 00014              PUSHL   40(AP)                                            ; 1360
                                              12  DD 00017              PUSHL   #18                                               ;
                      00000000G 00            02  FB 00019              CALLS   #2, FOR$$SIGNAL_STO                               ;
                             04 AC            01  88 00020 2$:          BISB2   #1, 4(AP)                                         ; 1362
                             46 AC            05  90 00024              MOVB    #5, 70(AP)                                        ; 1363
                             68 AC      2C    AC  D0 00028              MOVL    44(AP), 104(AP)                                   ; 1364
                                50            01  D0 0002D              MOVL    #1, R0                                            ; 1365
                                                  04 00030              RET                                                       ; 1367

; Routine Size:  49 bytes,    Routine Base:  _FOR$CODE + 01B9


; 1315          1368  1 !<BLF/PAGE>
```

```
1 %SBTTL 'STORE_CHARACTER - Store a character in a string'
1 ROUTINE STORE_CHARACTER =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       LIB$TPARSE action routine which stores the character at TPA$B_CHAR
1 !       at the location referenced by NML$A_VARCUR.  NML$A_VARCUR is then
1 !       incremented by 1.  If the character would be stored past the end
1 !       of the string, the procedure returns success without storing anything.
1 !
1 ! CALLING SEQUENCE:
1 !
1 !       status = STORE_CHARACTER ()
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       AP      Points to PARAM_BLOCK
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! COMPLETION STATUS:
1 !
1 !       1 for success
1 !
1 ! SIDE EFFECTS:
1 !
1 !       NONE
1 !
1 !--
1
2     BEGIN
2
2     BUILTIN
2         AP;                 ! Argument pointer points to parameter block
2
2     MAP
2         AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
2
2     IF .AP [NML$A_VARCUR] - .AP [NML$A_VARSTART] GEQA .AP [NML$W_VARSIZE]
2     THEN
2         RETURN 1;
2
2     CH$WCHAR_A (.AP [TPA$B_CHAR], AP [NML$A_VARCUR]);
2     RETURN 1;
2
1     END;
```

```
                                                    0000 00000 STORE_CHARACTER:
                                                                          .WORD   Save nothing                                  ; 1370
                     50     34   AC        2C    AC  C3 00002             SUBL3   44(AP), 52(AP), R0                            ; 1414
      50       38    AC          10              00  ED 00008             CMPZV   #0, #16, 56(AP), R0                           ;
                                                 08  1B 0000E             BLEQU   1$                                            ;
                            34   BC        18    AC  90 00010             MOVB    24(AP), @52(AP)                               ; 1418
                                           34    AC  D6 00015             INCL    52(AP)                                        ;
                                 50              01  D0 00018 1$:         MOVL    #1, R0                                        ; 1419
                                                     04 0001B             RET                                                   ; 1421

; Routine Size:  28 bytes,    Routine Base:  _FOR$CODE + 01EA


; 1370          1422  1 !<BLF/PAGE>
```

```
1 %SBTTL 'END_CHARACTER - End a character string'
1 ROUTINE END_CHARACTER =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       LIB$TPARSE action routine which is called at the end of a character string value.
1 !       It blank fills the string if necessary and advances NML$A_VARSTART and
1 !       NML$A_VARCUR.  If the repeat count is greater than 1, multiple copies
1 !       are stored.
1 !
1 ! CALLING SEQUENCE:
1 !
1 !       status = END_CHARACTER ()
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       AP      Points to PARAM_BLOCK
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NML$A_VARCUR = start of next string
1 !       NML$A_VARSTART = start of next string
1 !       User variable is modified.
1 !       NML$L_REPEATCT <= 1
1 !
1 ! COMPLETION STATUS:
1 !
1 !       1 for success
1 !
1 ! SIDE EFFECTS:
1 !
1 !       NONE
1 !
1 !--
1
2     BEGIN
2
2     BUILTIN
2         AP;             ! Argument pointer points to parameter block
2
2     MAP
2         AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
2
2     LOCAL
2         STRINGSIZE;     ! Size of string constant
2
2     STRINGSIZE = .AP [NML$A_VARCUR] - .AP [NML$A_VARSTART];
2     IF .STRINGSIZE LSSU .AP [NML$W_VARSIZE]
2     THEN
2         CH$FILL (%C' ', (.AP [NML$W_VARSIZE] - .STRINGSIZE), .AP [NML$A_VARCUR]);
2
2     !+
; 1429          1480 2        ! Update the current position in the variable.
; 1430          1481 2        !-
; 1431          1482 2
; 1432          1483 2        IF .AP [NML$W_STRIDE] NEQ 0
; 1433          1484 2        THEN
; 1434          1485 2            AP [NML$A_VARCUR] = .AP [NML$A_VARSTART] + .AP [NML$W_STRIDE]
; 1435          1486 2        ELSE
; 1436          1487 2            AP [NML$A_VARCUR] = .AP [NML$A_VAREND];
; 1437          1488 2
; 1438          1489 2        !+
; 1439          1490 2        ! While repeat count is greater than 1, store multiple copies.
; 1440          1491 2        !-
; 1441          1492 2
; 1442          1493 2        WHILE .AP [NML$L_REPEATCT] GTR 1 DO
; 1443          1494 3            BEGIN
; 1444          1495 3            IF .AP [NML$A_VARCUR] GEQA .AP [NML$A_VAREND]
; 1445          1496 3            THEN
; 1446          1497 3                FOR$$SIGNAL_STO (FOR$K_TOOMANVAL, .AP [NML$A_VARNAME]);
; 1447          1498 3            CH$MOVE (.AP [NML$W_VARSIZE], .AP [NML$A_VARSTART], .AP [NML$A_VARCUR]);
; 1448          1499 3            AP [NML$A_VARCUR] = .AP [NML$A_VARCUR] + .AP [NML$W_STRIDE];      ! Must be array!
; 1449          1500 3            AP [NML$L_REPEATCT] = .AP [NML$L_REPEATCT] - 1;
; 1450          1501 2            END;
; 1451          1502 2
; 1452          1503 2        AP [NML$A_VARSTART] = .AP [NML$A_VARCUR];
; 1453          1504 2        RETURN 1;
; 1454          1505 2
; 1455          1506 1        END;
```

```
                                                              007C 00000 END_CHARACTER:
                                                                                .WORD   Save R2,R3,R4,R5,R6                     ; 1424
                                           56        34   AC   9E 00002         MOVAB   52(AP), R6                              ; 1474
                         50                66        2C   AC   C3 00006         SUBL3   44(AP), (R6), STRINGSIZE
        50         38    AC                10             00   ED 0000B         CMPZV   #0, #16, 56(AP), STRINGSIZE             ; 1475
                                                          0F   1B 00011         BLEQU   1$
                                           51        38   AC   3C 00013         MOVZWL  56(AP), R1                              ; 1477
                         50                51             50   C3 00017         SUBL3   STRINGSIZE, R1, R0
        50               20                6E             00   2C 0001B         MOVC5   #0, (SP), #32, R0, @0(R6)
                                                     00   B6      00020
                                                     3A   AC   B5 00022  1$:    TSTW    58(AP)                                  ; 1483
                                                          0B   13 00025         BEQL    2$
                                           50        3A   AC   3C 00027         MOVZWL  58(AP), R0                              ; 1485
                                           66        2C BC40   9E 0002B         MOVAB   @44(AP)[R0], (R6)
                                                          04   11 00030         BRB     3$
                                           66        30   AC   D0 00032  2$:    MOVL    48(AP), (R6)                            ; 1487
                                           01        78   AC   D1 00036  3$:    CMPL    120(AP), #1                             ; 1493
                                                          25   15 0003A         BLEQ    5$
                                     30    AC             66   D1 0003C         CMPL    (R6), 48(AP)                            ; 1495
                                                          0C   1F 00040         BLSSU   4$
                                                     28   AC   DD 00042         PUSHL   40(AP)                                  ; 1497
                                                          12   DD 00045         PUSHL   #18
                              00000000G    00             02   FB 00047         CALLS   #2, FOR$$SIGNAL_STO
                   00    B6          2C    BC        38   AC   28 0004E  4$:    MOVC3   56(AP), @44(AP), @0(R6)                 ; 1498
                                           50        3A   AC   3C 00055         MOVZWL  58(AP), R0                              ; 1499
```

```
                     66              50  C0 00059          ADDL2   R0, (R6)                         ;
                                 78  AC  D7 0005C          DECL    120(AP)                          ; 1500
                                     D5  11 0005F          BRB     3$                               ; 1493
                 2C  AC              66  D0 00061 5$:      MOVL    (R6), 44(AP)                     ; 1503
                     50              01  D0 00065          MOVL    #1, R0                           ; 1504
                                         04 00068          RET                                      ; 1506

; Routine Size:  105 bytes,    Routine Base:  _FOR$CODE + 0206


; 1456          1507  1 !<BLF/PAGE>
```

```
1 %SBTTL 'STORE_REAL - Store a real constant'
1 ROUTINE STORE_REAL =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       LIB$TPARSE action routine which converts the real constant at
1 !       TPA$L_TOKENCNT and stores the value in NML$L_CONSBLOCK.
1 !
1 ! CALLING SEQUENCE:
1 !
1 !       status = STORE_REAL ()
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       AP      Points to PARAM_BLOCK
1 !       TPA$L_TOKENCNT - Descriptor of token
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NML$L_CONSBLOCK set to value of token
1 !       NML$B_CONSTYPE set to K_REAL
1 !
1 ! COMPLETION STATUS:
1 !
1 !       1 for success
1 !       0 if the token is of zero length.  This is because the pattern matches
1 !         the null string.
1 !
1 ! SIDE EFFECTS:
1 !
1 !       May call INPCONERR_ERROR
1 !       May signal FOR$_INVARGFOR
1 !
1 !--
1
2    BEGIN
2
2    BUILTIN
2       AP;             ! Argument pointer points to parameter block
2
2    MAP
2       AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
2
2    !+
2    ! If token is of zero length, then return failure.
2    !-
2
2    IF .AP [TPA$L_TOKENCNT] EQL 0
2    THEN
2       RETURN 0;
2
2    !+
        ! Since the pattern for a real matches a string such as "D123", which
        ! might be an identifier, check for the first character being a letter.
        ! If it is, then store the token, set the value to zero and return.
        ! If we don't do this, an identifier like D99999999999 would get a
        ! conversion error immediately.  No other "real" token can possibly
        ! be an identifier.
        !-

        IF CH$RCHAR (.AP [TPA$L_TOKENPTR]) GEQU %C'A' AND
           CH$RCHAR (.AP [TPA$L_TOKENPTR]) LEQU %C'z'
        THEN
            BEGIN
            AP [NML$L_CONSBLOCK] = 0;          ! Set value to zero
            AP [NML$B_CONSTYPE] = K_INTEGER;
            IF .AP [TPA$L_TOKENCNT] LEQ 31
            THEN
                BEGIN
                LOCAL
                    TOKEN: REF VECTOR [, BYTE];
                TOKEN = AP [NML$T_TOKEN];
                TOKEN [0] = .AP [TPA$L_TOKENCNT];
                CH$MOVE (.AP [TPA$L_TOKENCNT], .AP [TPA$L_TOKENPTR], TOKEN [1]);
                END
            ELSE
                AP [NML$T_TOKEN] = 0;
            RETURN 1;
            END
        ELSE
            AP [NML$T_TOKEN] = 0;

        !+
        ! Depending on the destination type, convert the token appropriately.
        !-

        IF ONE_OF (.AP [NML$B_DTYPE],
            DSC$K_DTYPE_L, DSC$K_DTYPE_W, DSC$K_DTYPE_B, DSC$K_DTYPE_WU,
            DSC$K_DTYPE_LU, DSC$K_DTYPE_D, DSC$K_DTYPE_DC)
        THEN
            BEGIN
            IF NOT OTS$CVT_T_D (AP [TPA$L_TOKENCNT], AP [NML$L_CONSBLOCK])
            THEN
                CALLG (.AP, INPCONERR_ERROR);
            END

        ELSE IF ONE_OF (.AP [NML$B_DTYPE], DSC$K_DTYPE_F, DSC$K_DTYPE_FC)
        THEN
            BEGIN
            IF NOT OTS$CVT_T_F (AP [TPA$L_TOKENCNT], AP [NML$L_CONSBLOCK])
            THEN
                CALLG (.AP, INPCONERR_ERROR);
            END

        ELSE IF ONE_OF (.AP [NML$B_DTYPE], DSC$K_DTYPE_G, DSC$K_DTYPE_GC)
        THEN
            BEGIN
            IF NOT OTS$CVT_T_G (AP [TPA$L_TOKENCNT], AP [NML$L_CONSBLOCK])
            THEN
```

```
; 1572          1622 3              CALLG (.AP, INPCONERR_ERROR);
; 1573          1623 3          END
; 1574          1624 3
; 1575          1625 3      ELSE IF ONE_OF (.AP [NML$B_DTYPE], DSC$K_DTYPE_H)
; 1576          1626 2      THEN
; 1577          1627 3          BEGIN
; 1578          1628 3          IF NOT OTS$CVT_T_H (AP [TPA$L_TOKENCNT], AP [NML$L_CONSBLOCK])
; 1579          1629 3          THEN
; 1580          1630 3              CALLG (.AP, INPCONERR_ERROR);
; 1581          1631 3          END
; 1582          1632 3
; 1583          1633 3      ELSE IF ONE_OF (.AP [NML$B_DTYPE], DSC$K_DTYPE_T)
; 1584          1634 2      THEN
; 1585          1635 3          BEGIN
; 1586          1636 3          AP [NML$L_CONSBLOCK] = 0;         ! Store zero result
; 1587          1637 3          CALLG (.AP, INPCONERR_ERROR);
; 1588          1638 3          END
; 1589          1639 3
; 1590          1640 2      ELSE        ! Invalid datatype
; 1591          1641 3          BEGIN
; 1592          1642 3          FOR$$SIGNAL_STO (FOR$K_INVARGFOR);
; 1593          1643 2          END;
; 1594          1644 2
; 1595          1645 2
; 1596          1646 2      AP [NML$B_CONSTYPE] = K_REAL;
; 1597          1647 2
; 1598          1648 2      RETURN 1;
; 1599          1649 2
; 1600          1650 1      END;



                                             007C 00000 STORE_REAL:
                                                              .WORD   Save R2,R3,R4,R5,R6                          ; 1509
                     56          10   AC  9E 00002            MOVAB   16(AP), R6                                   ; 1560
                                      66  D5 00006            TSTL    (R6)                                         ;
                                      03  12 00008            BNEQ    1$                                           ;
                                    00B4  31 0000A            BRW     16$                                          ;
                     41    8F    14   BC  91 0000D 1$:        CMPB    @20(AP), #65                                 ; 1573
                                      28  1F 00012            BLSSU   4$                                           ;
                     7A    8F    14   BC  91 00014            CMPB    @20(AP), #122                                ; 1574
                                      21  1A 00019            BGTRU   4$                                           ;
                                 68   AC  D4 0001B            CLRL    104(AP)                                      ; 1577
                     46    AC         02  90 0001E            MOVB    #2, 70(AP)                                   ; 1578
                           1F         66  D1 00022            CMPL    (R6), #31                                    ; 1579
                                      0F  14 00025            BGTR    2$                                           ;
                     50          7C   AC  9E 00027            MOVAB   124(AP), TOKEN                               ; 1584
                     60               66  90 0002B            MOVB    (R6), (TOKEN)                                ; 1585
          01   A0    14    BC         66  28 0002E            MOVC3   (R6), @20(AP), 1(TOKEN)                      ; 1586
                                      03  11 00034            BRB     3$                                           ; 1579
                                 7C   AC  94 00036 2$:        CLRB    124(AP)                                      ; 1589
                                    0081  31 00039 3$:        BRW     15$                                          ; 1590
                                 7C   AC  94 0003C 4$:        CLRB    124(AP)                                      ; 1593
                     52          44   AC  9A 0003F            MOVZBL  68(AP), R2                                   ; 1601
          50 1B940000  8F             52  78 00043            ASHL    R2, #462684160, R0                           ;
```

```
                                     11  18 0004B          BGEQ    6$                                  ;
                                68   AC  9F 0004D          PUSHAB  104(AP)                             ; 1604
                                     56  DD 00050          PUSHL   R6                                  ;
                 00000000G  00       02  FB 00052          CALLS   #2, OTS$CVT_T_D                     ;
                            5D       50  E8 00059 5$:      BLBS    R0, 14$                             ;
                                     4B  11 0005C          BRB     12$                                 ; 1606
                            0A       52  91 0005E 6$:      CMPB    R2, #10                             ; 1609
                                     05  13 00061          BEQL    7$                                  ;
                            0C       52  91 00063          CMPB    R2, #12                             ;
                                     0E  12 00066          BNEQ    8$                                  ;
                                68   AC  9F 00068 7$:      PUSHAB  104(AP)                             ; 1612
                                     56  DD 0006B          PUSHL   R6                                  ;
                 00000000G  00       02  FB 0006D          CALLS   #2, OTS$CVT_T_F                     ;
                                     E3  11 00074          BRB     5$                                  ;
                            1B       52  91 00076 8$:      CMPB    R2, #27                             ; 1617
                                     05  13 00079          BEQL    9$                                  ;
                            1D       52  91 0007B          CMPB    R2, #29                             ;
                                     0E  12 0007E          BNEQ    10$                                 ;
                                68   AC  9F 00080 9$:      PUSHAB  104(AP)                             ; 1620
                                     56  DD 00083          PUSHL   R6                                  ;
                 00000000G  00       02  FB 00085          CALLS   #2, OTS$CVT_T_G                     ;
                                     CB  11 0008C          BRB     5$                                  ;
                            1C       52  91 0008E 10$:     CMPB    R2, #28                             ; 1625
                                     0E  12 00091          BNEQ    11$                                 ;
                                68   AC  9F 00093          PUSHAB  104(AP)                             ; 1628
                                     56  DD 00096          PUSHL   R6                                  ;
                 00000000G  00       02  FB 00098          CALLS   #2, OTS$CVT_T_H                     ;
                                     B8  11 0009F          BRB     5$                                  ;
                            0E       52  91 000A1 11$:     CMPB    R2, #14                             ; 1633
                                     0A  12 000A4          BNEQ    13$                                 ;
                                68   AC  D4 000A6          CLRL    104(AP)                             ; 1636
                     0000V  CF       6C  FA 000A9 12$:     CALLG   (AP), INPCONERR_ERROR               ; 1637
                                     09  11 000AE          BRB     14$                                 ; 1633
                                     30  DD 000B0 13$:     PUSHL   #48                                 ; 1642
                 00000000G  00       01  FB 000B2          CALLS   #1, FOR$$SIGNAL_STO                 ;
                        46  AC       03  90 000B9 14$:     MOVB    #3, 70(AP)                          ; 1646
                            50       01  D0 000BD 15$:     MOVL    #1, R0                              ; 1648
                                         04 000C0          RET                                         ;
                                     50  D4 000C1 16$:     CLRL    R0                                  ; 1650
                                         04 000C3          RET                                         ;

; Routine Size:  196 bytes,    Routine Base:  _FOR$CODE + 026F


; 1601         1651  1 !<BLF/PAGE>
```

```
1 %SBTTL 'STORE_LOGICAL - Store a logical value'
1 ROUTINE STORE_LOGICAL =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       LIB$TPARSE action routine which converts the logical value at
1 !       TPA$L_TOKENCNT and stores the value at NML$L_CONSBLOCK.  If the
1 !       token is possibly an identifier, the token is saved at NML$T_TOKEN.
1 !
1 ! CALLING SEQUENCE:
1 !
1 !       status = STORE_LOGICAL ()
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       AP      Points to PARAM_BLOCK
1 !       TPA$L_TOKENCNT is descriptor of token
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NML$L_CONSBLOCK gets converted value
1 !       NML$B_CONSTYPE gets K_LOGICAL
1 !       NML$T_TOKEN gets token if possibly an identifier
1 !
1 ! COMPLETION STATUS:
1 !
1 !       1 for success
1 !
1 ! SIDE EFFECTS:
1 !
1 !       NONE
1 !
1 !--
1
2     BEGIN
2
2     BUILTIN
2         AP;                   ! Argument pointer points to parameter block
2
2     MAP
2         AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
2
2     IF CH$RCHAR (.AP [TPA$L_TOKENPTR]) NEQ %C'.' AND
2        .AP [TPA$L_TOKENCNT] LEQ 31
2     THEN
3         BEGIN
3         LOCAL
3             TOKEN: REF VECTOR [, BYTE];
3         TOKEN = AP [NML$T_TOKEN];
3         TOKEN [0] = .AP [TPA$L_TOKENCNT];
3         CH$MOVE (.AP [TPA$L_TOKENCNT], .AP [TPA$L_TOKENPTR], TOKEN [1]);
3         END
```

```
; 1660          1709  2        ELSE
; 1661          1710  2            AP [NML$T_TOKEN] = 0;
; 1662          1711  2
; 1663          1712  2        OTS$CVT_TL_L (AP [TPA$L_TOKENCNT], AP [NML$L_CONSBLOCK]);
; 1664          1713  2        AP [NML$B_CONSTYPE] = K_LOGICAL;
; 1665          1714  2        RETURN 1;
; 1666          1715  2
; 1667          1716  1        END;



                                              003C 00000 STORE_LOGICAL:
                                                                .WORD   Save R2,R3,R4,R5                                  ; 1653
                            2E       14   BC   91 00002        CMPB    @20(AP), #46                                      ; 1699
                                          17   13 00006        BEQL    1$                                                ;
                            1F       10   AC   D1 00008        CMPL    16(AP), #31                                       ; 1700
                                          11   14 0000C        BGTR    1$                                                ;
                            50       7C   AC   9E 0000E        MOVAB   124(AP), TOKEN                                    ; 1705
                            60       10   AC   90 00012        MOVB    16(AP), (TOKEN)                                   ; 1706
          01    A0       14 BC       10   AC   28 00016        MOVC3   16(AP), @20(AP), 1(TOKEN)                         ; 1707
                                          03   11 0001D        BRB     2$                                                ; 1699
                                     7C   AC   94 0001F 1$:    CLRB    124(AP)                                           ; 1710
                                     68   AC   9F 00022 2$:    PUSHAB  104(AP)                                           ; 1712
                                     10   AC   9F 00025        PUSHAB  16(AP)                                            ;
                     00000000G  00        02   FB 00028        CALLS   #2, OTS$CVT_TL_L                                  ;
                            46  AC        01   90 0002F        MOVB    #1, 70(AP)                                        ; 1713
                            50            01   D0 00033        MOVL    #1, R0                                            ; 1714
                                               04 00036        RET                                                       ; 1716

; Routine Size:  55 bytes,    Routine Base:  _FOR$CODE + 0333


; 1668          1717  1 !<BLF/PAGE>
```

```
1 %SBTTL 'STORE_COMPLEX - Store a complex constant'
1 ROUTINE STORE_COMPLEX =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       LIB$TPARSE action routine which converts the current token as a real
1 !       value and converts it to either the real part or the imaginary part
1 !       of a complex value.
1 !
1 ! CALLING SEQUENCE:
1 !
1 !       status = STORE_COMPLEX ()
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       AP       Points to PARAM_BLOCK
1 !       TPA$L_TOKENCNT - Descriptor of token
1 !       NML$V_IMAG     - Set if real part already seen
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NML$L_CONSBLOCK set to value of token
1 !       NML$B_CONSTYPE set to K_COMPLEX
1 !       NML$V_IMAG set to 1
1 !
1 ! COMPLETION STATUS:
1 !
1 !       1 for success
1 !       0 if the token is of zero length.  This is because the pattern matches
1 !         the null string.
1 !
1 ! SIDE EFFECTS:
1 !
1 !       May call INPCONERR_ERROR
1 !       May signal FOR$_INVARGFOR
1 !
1 !--
1
2     BEGIN
2
2     BUILTIN
2       AP;                 ! Argument pointer points to parameter block
2
2     MAP
2       AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
2
2     LOCAL
2       L_DTYPE,                          ! Local data type
2       L_CONSBLOCK: VECTOR [4, LONG];    ! Local constant block
2
2     !+
2     ! If token is of zero length, then return failure.
```

```
  2      !-
  2
  2      IF .AP [TPA$L_TOKENCNT] EQL 0
  2      THEN
  2          RETURN 0;
  2
  2      !+
  2      ! Depending on the destination type, convert the token appropriately.
  2      !-
  2
  2
  3      IF ONE_OF (.AP [NML$B_DTYPE], DSC$K_DTYPE_F, DSC$K_DTYPE_FC)
  2      THEN
  3          BEGIN
  3          IF NOT OTS$CVT_T_F (AP [TPA$L_TOKENCNT], L_CONSBLOCK)
  3          THEN
  3              CALLG (.AP, INPCONERR_ERROR);
  3          END
  3
P 2      ELSE IF ONE_OF (.AP [NML$B_DTYPE],
P 2          DSC$K_DTYPE_L, DSC$K_DTYPE_W, DSC$K_DTYPE_B, DSC$K_DTYPE_LU,
  3          DSC$K_DTYPE_WU, DSC$K_DTYPE_D, DSC$K_DTYPE_DC)
  2      THEN
  3          BEGIN
  3          IF NOT OTS$CVT_T_D (AP [TPA$L_TOKENCNT], L_CONSBLOCK)
  3          THEN
  3              CALLG (.AP, INPCONERR_ERROR);
  3          END
  3
  3      ELSE IF ONE_OF (.AP [NML$B_DTYPE], DSC$K_DTYPE_G, DSC$K_DTYPE_GC)
  2      THEN
  3          BEGIN
  3          IF NOT OTS$CVT_T_G (AP [TPA$L_TOKENCNT], L_CONSBLOCK)
  3          THEN
  3              CALLG (.AP, INPCONERR_ERROR);
  3          END
  3
  3      ELSE IF ONE_OF (.AP [NML$B_DTYPE], DSC$K_DTYPE_H)
  2      THEN
  3          BEGIN
  3          IF NOT OTS$CVT_T_H (AP [TPA$L_TOKENCNT], L_CONSBLOCK)
  3          THEN
  3              CALLG (.AP, INPCONERR_ERROR);
  3          END
  3
  3      ELSE IF ONE_OF (.AP [NML$B_DTYPE], DSC$K_DTYPE_T)
  2      THEN
  3          BEGIN
  3          L_CONSBLOCK [0] = 0;     ! Store zero result
  3          CALLG (.AP, INPCONERR_ERROR);
  3          END
  3
  2      ELSE
  3          BEGIN
  3          FOR$$SIGNAL_STO (FOR$K_INVARGFOR);
  2          END;
  2
```

```
2
2     AP [NML$B_CONSTYPE] = K_COMPLEX;
2
2     !+
2     ! Now convert the local constant to the proper complex type and store in
2     ! either the real or imaginary part of NML$L_CONSBLOCK.
2     !-
2
2     SELECTONE .AP [NML$B_DTYPE] OF
2         SET
2         [DSC$K_DTYPE_FC]:
2             L_DTYPE = DSC$K_DTYPE_F;
2         [DSC$K_DTYPE_DC]:
2             L_DTYPE = DSC$K_DTYPE_D;
2         [DSC$K_DTYPE_GC]:
2             L_DTYPE = DSC$K_DTYPE_G;
2         [OTHERWISE]:
2             L_DTYPE = .AP [NML$B_DTYPE];
2         TES;
2     IF NOT .AP [NML$V_IMAG]             ! If real part
2     THEN
3         BEGIN
3         IF NOT FOR$$CVT_TYPE (K_REAL, L_CONSBLOCK,
3                              .L_DTYPE, AP [NML$L_CONSBLOCK], 0)
3         THEN
4             BEGIN
4             AP [NML$L_CONSBLOCK] = 0;   ! Store zero result
4             CALLG (.AP, INPCONERR_ERROR);
3             END;
3         AP [NML$V_IMAG] = 1;
3         END
2     ELSE
3         BEGIN
3         IF .L_DTYPE EQL DSC$K_DTYPE_H
3         THEN
3             RETURN 1;
3         IF NOT FOR$$CVT_TYPE (K_REAL, L_CONSBLOCK,
3                              .L_DTYPE,
4                              (IF .L_DTYPE EQL DSC$K_DTYPE_F
4                               THEN
4                                   AP [NML$L_CONSBLOCK] + 4
4                               ELSE
3                                   AP [NML$L_CONSBLOCK] + 8),
3                               0)
3         THEN
4             BEGIN
4             IF .L_DTYPE EQL DSC$K_DTYPE_F
4             THEN
4                 AP [NML$L_CONSBLOCK]+4 = 0         ! Store zero result
4             ELSE
4                 AP [NML$L_CONSBLOCK]+8 = 0;
4             CALLG (.AP, INPCONERR_ERROR);
3             END;
2         END;
2
2     RETURN 1;
2
```

```
; 1841          1889  1      END;




                                        003C 00000 STORE_COMPLEX:
                                                          .WORD   Save R2,R3,R4,R5                           ; 1719
                          55     0000V   CF   9E 00002          MOVAB   INPCONERR_ERROR, R5                        :
                          54 00000000G   00   9E 00007          MOVAB   FOR$$CVT_TYPE, R4                          :
                          5E             10   C2 0000E          SUBL2   #16, SP                                    :
                          53       10    AC   9E 00011          MOVAB   16(AP), R3                                 ; 1777
                                         63   D5 00015          TSTL    (R3)                                       :
                                         03   12 00017          BNEQ    1$                                         :
                                       00FA   31 00019          BRW     23$                                        :
                          52       44    AC   9A 0001C 1$:      MOVZBL  68(AP), R2                                 ; 1786
                          0A             52   91 00020          CMPB    R2, #10                                    :
                                         05   13 00023          BEQL    2$                                         :
                          0C             52   91 00025          CMPB    R2, #12                                    :
                                         10   12 00028          BNEQ    4$                                         :
                                 4008    8F   BB 0002A 2$:      PUSHR   #^M<R3,SP>                                 ; 1789
                    00000000G    00      02   FB 0002E          CALLS   #2, OTS$CVT_T_F                            :
                          57             50   E8 00035 3$:      BLBS    R0, 11$                                    :
                                         47   11 00038          BRB     9$                                         ; 1791
                   50 1B940000   8F      52   78 0003A 4$:      ASHL    R2, #462684160, R0                         ; 1796
                                         0D   18 00042          BGEQ    5$                                         :
                                 4008    8F   BB 00044          PUSHR   #^M<R3,SP>                                 ; 1799
                    00000000G    00      02   FB 00048          CALLS   #2, OTS$CVT_T_D                            :
                                         E4   11 0004F          BRB     3$                                         :
                          1B             52   91 00051 5$:      CMPB    R2, #27                                    ; 1804
                                         05   13 00054          BEQL    6$                                         :
                          1D             52   91 00056          CMPB    R2, #29                                    :
                                         0D   12 00059          BNEQ    7$                                         :
                                 4008    8F   BB 0005B 6$:      PUSHR   #^M<R3,SP>                                 ; 1807
                    00000000G    00      02   FB 0005F          CALLS   #2, OTS$CVT_T_G                            :
                                         CD   11 00066          BRB     3$                                         :
                          1C             52   91 00068 7$:      CMPB    R2, #28                                    ; 1812
                                         0D   12 0006B          BNEQ    8$                                         :
                                 4008    8F   BB 0006D          PUSHR   #^M<R3,SP>                                 ; 1815
                    00000000G    00      02   FB 00071          CALLS   #2, OTS$CVT_T_H                            :
                                         BB   11 00078          BRB     3$                                         :
                          0E             52   91 0007A 8$:      CMPB    R2, #14                                    ; 1820
                                         07   12 0007D          BNEQ    10$                                        :
                                         6E   D4 0007F          CLRL    L_CONSBLOCK                                ; 1823
                          65             6C   FA 00081 9$:      CALLG   (AP), INPCONERR_ERROR                      ; 1824
                                         09   11 00084          BRB     11$                                        ; 1820
                                         30   DD 00086 10$:     PUSHL   #48                                        ; 1829
                    00000000G    00      01   FB 00088          CALLS   #1, FOR$$SIGNAL_STO                        :
                          46     AC      04   90 0008F 11$:     MOVB    #4, 70(AP)                                 ; 1833
                          50       44    AC   9A 00093          MOVZBL  68(AP), R0                                 ; 1840
                          0C             50   91 00097          CMPB    R0, #12                                    ; 1842
                                         05   12 0009A          BNEQ    12$                                        :
                          52             0A   D0 0009C          MOVL    #10, L_DTYPE                               ; 1843
                                         17   11 0009F          BRB     15$                                        :
                          0D             50   91 000A1 12$:     CMPB    R0, #13                                    ; 1844
                                         05   12 000A4          BNEQ    13$                                        :
                          52             0B   D0 000A6          MOVL    #11, L_DTYPE                               ; 1845
```

```
                                      0D  11 000A9          BRB     15$                                                  ;
                       1D             50  91 000AB 13$:     CMPB    R0, #29                                              ; 1846
                                      05  12 000AE          BNEQ    14$                                                  ;
                       52             1B  D0 000B0          MOVL    #27, L_DTYPE                                         ; 1847
                                      03  11 000B3          BRB     15$                                                  ;
                       52             50  D0 000B5 14$:     MOVL    R0, L_DTYPE                                          ; 1849
           1E     45   AC             01  E0 000B8 15$:     BBS     #1, 69(AP), 17$                                      ; 1851
                                      7E  D4 000BD          CLRL    -(SP)                                                ; 1855
                              68      AC  9F 000BF          PUSHAB  104(AP)                                              ;
                                      52  DD 000C2          PUSHL   L_DTYPE                                              ;
                              0C      AE  9F 000C4          PUSHAB  L_CONSBLOCK                                          ; 1854
                                      03  DD 000C7          PUSHL   #3                                                   ; 1855
                       64             05  FB 000C9          CALLS   #5, FOR$$CVT_TYPE                                    ;
                       06             50  E8 000CC          BLBS    R0, 16$                                              ;
                              68      AC  D4 000CF          CLRL    104(AP)                                              ; 1858
                       65             6C  FA 000D2          CALLG   (AP), INPCONERR_ERROR                                ; 1859
                  45   AC             02  88 000D5 16$:     BISB2   #2, 69(AP)                                           ; 1861
                                      37  11 000D9          BRB     22$                                                  ; 1851
                       1C             52  D1 000DB 17$:     CMPL    L_DTYPE, #28                                         ; 1865
                                      32  13 000DE          BEQL    22$                                                  ;
                                      7E  D4 000E0          CLRL    -(SP)                                                ; 1868
                                      53  D4 000E2          CLRL    R3                                                   ; 1870
                       0A             52  D1 000E4          CMPL    L_DTYPE, #10                                         ;
                                      08  12 000E7          BNEQ    18$                                                  ;
                                      53  D6 000E9          INCL    R3                                                   ;
                       50     6C      AC  9E 000EB          MOVAB   108(AP), R0                                          ; 1872
                                      04  11 000EF          BRB     19$                                                  ;
                       50     70      AC  9E 000F1 18$:     MOVAB   112(AP), R0                                          ; 1874
                                      50  DD 000F5 19$:     PUSHL   R0                                                   ;
                                      52  DD 000F7          PUSHL   L_DTYPE                                              ; 1869
                              0C      AE  9F 000F9          PUSHAB  L_CONSBLOCK                                          ; 1868
                                      03  DD 000FC          PUSHL   #3                                                   ;
                       64             05  FB 000FE          CALLS   #5, FOR$$CVT_TYPE                                    ;
                       0E             50  E8 00101          BLBS    R0, 22$                                              ;
                       05             53  E9 00104          BLBC    R3, 20$                                              ; 1878
                              6C      AC  D4 00107          CLRL    108(AP)                                              ; 1880
                                      03  11 0010A          BRB     21$                                                  ;
                              70      AC  D4 0010C 20$:     CLRL    112(AP)                                              ; 1882
                       65             6C  FA 0010F 21$:     CALLG   (AP), INPCONERR_ERROR                                ; 1883
                       50             01  D0 00112 22$:     MOVL    #1, R0                                               ; 1887
                                          04 00115          RET                                                          ;
                                      50  D4 00116 23$:     CLRL    R0                                                   ; 1889
                                          04 00118          RET                                                          ;

; Routine Size:  281 bytes,    Routine Base:  _FOR$CODE + 036A


; 1842          1890  1 !<BLF/PAGE>
```

```
1 %SBTTL 'STORE_REPEAT - Store a repeat count'
1 ROUTINE STORE_REPEAT =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       LIB$TPARSE action routine which stores the repeat count into the
1 !       parameter block.
1 !
1 ! CALLING SEQUENCE:
1 !
1 !       status = STORE_REPEAT ()
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       AP      Points to PARAM_BLOCK
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NML$L_REPEATCT gets the repeat count
1 !       NML$B_CONSTYPE = K_NULL
1 !
1 ! COMPLETION STATUS:
1 !
1 !       1 for success
1 !
1 ! SIDE EFFECTS:
1 !
1 !       May signal FOR$_SYNERRNAM, syntax error in NAMELIST input
1 !
1 !--
1
2   BEGIN
2
2   BUILTIN
2       AP;             ! Argument pointer points to parameter block
2
2   MAP
2       AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
2
2   IF .AP [TPA$L_NUMBER] LEQ 0
2   THEN
2       CALLG (.AP, SYNTAX_ERROR);
2
2   AP [NML$L_REPEATCT] = .AP [TPA$L_NUMBER];
2   AP [NML$B_CONSTYPE] = K_NULL;       ! Initially treat as null value
2
2   RETURN 1;
2
1   END;
```

```
                                          0000 00000 STORE_REPEAT:
                                                           .WORD      Save nothing                          ; 1892
                             1C     AC   D5 00002          TSTL       28(AP)                                ; 1935
                                    05   14 00005          BGTR       1$                                    ;
               0000V   CF           6C   FA 00007          CALLG      (AP), SYNTAX_ERROR                    ; 1937
                  78   AC    1C     AC   D0 0000C 1$:      MOVL       28(AP), 120(AP)                       ; 1939
                             46     AC   94 00011          CLRB       70(AP)                                ; 1940
                       50           01   D0 00014          MOVL       #1, R0                                ; 1942
                                         04 00017          RET                                              ; 1944

; Routine Size:  24 bytes,    Routine Base:  _FOR$CODE + 0483


; 1898         1945  1 !<BLF/PAGE>
; 1900          1946   1 %SBTTL 'END_REPEAT - End a repeated value'
; 1901          1947   1 ROUTINE END_REPEAT =
; 1902          1948   1
; 1903          1949   1 !++
; 1904          1950   1 ! FUNCTIONAL DESCRIPTION:
; 1905          1951   1 !
; 1906          1952   1 !       LIB$TPARSE action routine which marks the end of a repeated value.
; 1907          1953   1 !
; 1908          1954   1 ! CALLING SEQUENCE:
; 1909          1955   1 !
; 1910          1956   1 !       status = END_REPEAT ()
; 1911          1957   1 !
; 1912          1958   1 ! FORMAL PARAMETERS:
; 1913          1959   1 !
; 1914          1960   1 !       NONE
; 1915          1961   1 !
; 1916          1962   1 ! IMPLICIT INPUTS:
; 1917          1963   1 !
; 1918          1964   1 !       AP      Points to PARAM_BLOCK
; 1919          1965   1 !
; 1920          1966   1 ! IMPLICIT OUTPUTS:
; 1921          1967   1 !
; 1922          1968   1 !       NML$T_TOKEN = 0, meaning that this value can't be an identifier
; 1923          1969   1 !       TPA$V_BLANKS = 0, disabling explicit blank processing
; 1924          1970   1 !
; 1925          1971   1 ! COMPLETION STATUS:
; 1926          1972   1 !
; 1927          1973   1 !       1 for success
; 1928          1974   1 !
; 1929          1975   1 ! SIDE EFFECTS:
; 1930          1976   1 !
; 1931          1977   1 !       NONE
; 1932          1978   1 !
; 1933          1979   1 !--
; 1934          1980   1
; 1935          1981   2   BEGIN
; 1936          1982   2
; 1937          1983   2   BUILTIN
; 1938          1984   2       AP;               ! Argument pointer points to parameter block
; 1939          1985   2
; 1940          1986   2   MAP
; 1941          1987   2       AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
; 1942          1988   2
; 1943          1989   2   AP [NML$T_TOKEN] = 0;       ! Inhibit use of this token as an identifier
; 1944          1990   2   AP [TPA$V_BLANKS] = 0;      ! Turn off explicit blank processing
; 1945          1991   2
; 1946          1992   2   RETURN 1;
; 1947          1993   2
; 1948          1994   1   END;


                                             0000 00000 END_REPEAT:
                                                               .WORD   Save nothing                              ; 1947
                                   7C    AC  94 00002          CLRB    124(AP)                                   ; 1989
```

```
                         04    AC           01  8A 00005          BICB2   #1, 4(AP)                          ; 1990
                               50           01  D0 00009          MOVL    #1, R0                             ; 1992
                                                04 0000C          RET                                        ; 1994

; Routine Size:  13 bytes,    Routine Base:  _FOR$CODE + 049B


; 1949          1995  1 !<BLF/PAGE>
```

```
1 %SBTTL 'STORE_VALUE - Store a value in a variable'
1 ROUTINE STORE_VALUE=
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       LIB$TPARSE action routine which stores the value just read in the
1 !       current variable.  If the repeat count is greater than 1, multiple
1 !       copies are moved.  However, if the value was of type CHARACTER,
1 !       all copies have been stored and this routine only returns success.
1 !       If the constant type is NULL, then "repeat-count" values are skipped.
1 !
1 ! CALLING SEQUENCE:
1 !
1 !       status = STORE_VALUE ()
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       AP      Points to PARAM_BLOCK
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       The user variable is modified (if value not NULL)
1 !
1 ! COMPLETION STATUS:
1 !
1 !       1 for success
1 !
1 ! SIDE EFFECTS:
1 !
1 !       Signals FOR$_SYNERRNAM if an error occurs during conversion.
1 !
1 !--
1
2     BEGIN
2
2     BUILTIN
2         AP;                 ! Argument pointer points to parameter block
2
2     MAP
2         AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
2
2     !+
2     ! If this was a character string, all values have been stored.
2     !-
2
2     IF .AP [NML$B_CONSTYPE] EQL K_CHARACTER
2     THEN
2         RETURN 1;
2
2     !+
2     ! Check to see if we are past the end of the variable or array
2     !-
```

```
2
2           IF .AP [NML$A_VARSTART] GEQA .AP [NML$A_VAREND]
2           THEN
3               BEGIN
3               FOR$$SIGNAL_STO (FOR$K_TOOMANVAL, .AP [NML$A_VARNAME]);
3               RETURN 0;
2               END;
2
2           !+
2           ! If this was a repeated null (n*), then skip over values.
2           !-
2
2           IF .AP [NML$B_CONSTYPE] EQL K_NULL
2           THEN
2               WHILE .AP [NML$L_REPEATCT] GTR 0 DO
3                   BEGIN
3                   IF .AP [NML$A_VARCUR] GEQA .AP [NML$A_VAREND]
3                   THEN
4                       BEGIN
4                       FOR$$SIGNAL_STO (FOR$K_TOOMANVAL, .AP [NML$A_VARNAME]);
4                       RETURN 0;
3                       END;
3                   AP [NML$A_VARCUR] = .AP [NML$A_VARCUR] + .AP [NML$W_VARSIZE];
3                   AP [NML$L_REPEATCT] = .AP [NML$L_REPEATCT] - 1;
3                   END
2           ELSE
3               BEGIN
3
3               !+
3               ! Call routine to convert value to the appropriate destination type.
3               ! If conversion fails, signal an error.
3               !-
3
3               IF NOT FOR$$CVT_TYPE (.AP [NML$B_CONSTYPE], AP [NML$L_CONSBLOCK],
3                                     .AP [NML$B_DTYPE], .AP [NML$A_VARSTART], 0)
3               THEN
3                   CALLG (.AP, INPCONERR_ERROR);
3               AP [NML$A_VARCUR] = .AP [NML$A_VARSTART] + .AP [NML$W_VARSIZE];
3
3               !+
3               ! While repeat count is greater than 1, store copies of the value.
3               !-
3
3               WHILE .AP [NML$L_REPEATCT] GTR 1 DO
4                   BEGIN
4                   IF .AP [NML$A_VARCUR] GEQA .AP [NML$A_VAREND]
4                   THEN
5                       BEGIN
5                       FOR$$SIGNAL_STO (FOR$K_TOOMANVAL, .AP [NML$A_VARNAME]);
5                       RETURN 0;
4                       END;
4                   AP [NML$A_VARCUR] = CH$MOVE (.AP [NML$W_VARSIZE], .AP [NML$A_VARSTART],
4                                                .AP [NML$A_VARCUR]);
4                   AP [NML$L_REPEATCT] = .AP [NML$L_REPEATCT] - 1;
3                   END;
2               END;
2
```

```
; 2065          2110  2       !+
; 2066          2111  2       ! Turn off NML$V_IMAG if set.  This lets subsequent complex values get
; 2067          2112  2       ! stored correctly.
; 2068          2113  2       !-
; 2069          2114  2
; 2070          2115  2       AP [NML$V_IMAG] = 0;
; 2071          2116  2
; 2072          2117  2       !+
; 2073          2118  2       ! Update VARSTART with new position
; 2074          2119  2       !-
; 2075          2120  2
; 2076          2121  2       AP [NML$A_VARSTART] = .AP [NML$A_VARCUR];
; 2077          2122  2       RETURN 1;
; 2078          2123  1       END;



                                                      00FC 00000 STORE_VALUE:
                                                                       .WORD   Save R2,R3,R4,R5,R6,R7                         ; 1997
                              05        46    AC  91 00002            CMPB    70(AP), #5                                     ; 2046
                                                03  12 00006            BNEQ    1$                                             ;
                                              0080  31 00008            BRW     9$                                             ;
                         30   AC        2C    AC  D1 0000B 1$:        CMPL    44(AP), 48(AP)                                 ; 2054
                                                55  1E 00010            BGEQU   6$                                             ;
                              57        78    AC  9E 00012            MOVAB   120(AP), R7                                    ; 2067
                              56        34    AC  9E 00016            MOVAB   52(AP), R6                                     ; 2069
                                        46    AC  95 0001A            TSTB    70(AP)                                         ; 2065
                                              15  12 0001D            BNEQ    3$                                             ;
                                              67  D5 0001F 2$:        TSTL    (R7)                                           ; 2067
                                              60  15 00021            BLEQ    8$                                             ;
                         30   AC              66  D1 00023            CMPL    (R6), 48(AP)                                   ; 2069
                                              3E  1E 00027            BGEQU   6$                                             ;
                              50        38    AC  3C 00029            MOVZWL  56(AP), R0                                     ; 2075
                              66              50  C0 0002D            ADDL2   R0, (R6)                                       ;
                                              67  D7 00030            DECL    (R7)                                           ; 2076
                                              EB  11 00032            BRB     2$                                             ; 2067
                                              7E  D4 00034 3$:        CLRL    -(SP)                                          ; 2086
                                        2C    AC  DD 00036            PUSHL   44(AP)                                         ; 2087
                              7E        44    AC  9A 00039            MOVZBL  68(AP), -(SP)                                  ;
                                        68    AC  9F 0003D            PUSHAB  104(AP)                                        ; 2086
                              7E        46    AC  9A 00040            MOVZBL  70(AP), -(SP)                                  ;
                   00000000G  00              05  FB 00044            CALLS   #5, FOR$$CVT_TYPE                              ;
                              05              50  E8 0004B            BLBS    R0, 4$                                         ;
                       0000V  CF              6C  FA 0004E            CALLG   (AP), INPCONERR_ERROR                          ; 2089
                              50        38    AC  3C 00053 4$:        MOVZWL  56(AP), R0                                     ; 2090
                              66        2C  BC40  9E 00057            MOVAB   @44(AP)[R0], (R6)                              ;
                              01              67  D1 0005C 5$:        CMPL    (R7), #1                                       ; 2096
                                              22  15 0005F            BLEQ    8$                                             ;
                         30   AC              66  D1 00061            CMPL    (R6), 48(AP)                                   ; 2098
                                              0E  1F 00065            BLSSU   7$                                             ;
                                        28    AC  DD 00067 6$:        PUSHL   40(AP)                                         ; 2101
                                              12  DD 0006A            PUSHL   #18                                            ;
                   00000000G  00              02  FB 0006C            CALLS   #2, FOR$$SIGNAL_STO                            ;
                                              1A  11 00073            BRB     10$                                            ; 2102
           00   B6       2C   BC        38    AC  28 00075 7$:        MOVC3   56(AP), @44(AP), @0(R6)                        ; 2105
```

```
                           66           53  D0 0007C         MOVL    R3, (R6)                        ;
                                        67  D7 0007F         DECL    (R7)                            ; 2106
                                        D9  11 00081         BRB     5$                              ; 2096
                      45   AC           02  8A 00083  8$:    BICB2   #2, 69(AP)                      ; 2115
                      2C   AC           66  D0 00087         MOVL    (R6), 44(AP)                    ; 2121
                           50           01  D0 0008B  9$:    MOVL    #1, R0                          ; 2122
                                            04 0008E         RET                                     ;
                                        50  D4 0008F  10$:   CLRL    R0                              ; 2123
                                            04 00091         RET                                     ;

; Routine Size:  146 bytes,    Routine Base:  _FOR$CODE + 04A8


; 2079          2124  1 !<BLF/PAGE>
```

```
 1 %SBTTL 'NULL_VALUE - Skip an element'
 1 ROUTINE NULL_VALUE =
 1
 1 !++
 1 ! FUNCTIONAL DESCRIPTION:
 1 !
 1 !       LIB$TPARSE action routine which is called when a comma is found in place
 1 !       of a value.  The pointer to the current element is advanced one element
 1 !       with no change being made to the current element.  Note that if the
 1 !       current variable is not an array, an attempt to store a following value
 1 !       will be an error.  If we have already passed the last element, give
 1 !       an error.
 1 !
 1 ! CALLING SEQUENCE:
 1 !
 1 !       status = NULL_VALUE ()
 1 !
 1 ! FORMAL PARAMETERS:
 1 !
 1 !       NONE
 1 !
 1 ! IMPLICIT INPUTS:
 1 !
 1 !       AP      Points to PARAM_BLOCK
 1 !
 1 ! IMPLICIT OUTPUTS:
 1 !
 1 !       NML$A_VARSTART is advanced one element.
 1 !       NML$A_VARCUR = NML$A_VARSTART
 1 !
 1 ! COMPLETION STATUS:
 1 !
 1 !       1
 1 !
 1 ! SIDE EFFECTS:
 1 !
 1 !       FOR$_TOOMANVAL - if this comma implies a skip past the end of the
 1 !       variable.
 1 !
 1 !--
 1
 2    BEGIN
 2
 2    BUILTIN
 2       AP;             ! Argument pointer points to parameter block
 2
 2    MAP
 2       AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
 2
 2    !+
 2    ! If we are already past the end of the variable, give an error.
 2    !-
 2
 2    IF .AP [NML$A_VARSTART] GEQA .AP [NML$A_VAREND]
 2    THEN
 2       FOR$$SIGNAL_STO (FOR$K_TOOMANVAL, .AP [NML$A_VARNAME]);
 2
```

```
; 2138          2182  2        IF .AP [NML$W_STRIDE] NEQ 0
; 2139          2183  2        THEN
; 2140          2184  2            AP [NML$A_VARSTART] = .AP [NML$A_VARSTART] + .AP [NML$W_STRIDE]
; 2141          2185  2        ELSE
; 2142          2186  2            AP [NML$A_VARSTART] = .AP [NML$A_VAREND];
; 2143          2187  2
; 2144          2188  2        AP [NML$A_VARCUR] = .AP [NML$A_VARSTART];
; 2145          2189  2
; 2146          2190  2        RETURN 1;
; 2147          2191  2
; 2148          2192  1        END;



                                                    0000 00000 NULL_VALUE:
                                                                          .WORD    Save nothing                          ; 2126
                  30    AC          2C    AC    D1 00002               CMPL     44(AP), 48(AP)                        ; 2178
                                          0C    1F 00007               BLSSU    1$
                                    28    AC    DD 00009               PUSHL    40(AP)                                ; 2180
                                          12    DD 0000C               PUSHL    #18
           00000000G    00                02    FB 0000E               CALLS    #2, FOR$$SIGNAL_STO
                                    3A    AC    B5 00015  1$:          TSTW     58(AP)                                ; 2182
                                          0A    13 00018               BEQL     2$
                        50          3A    AC    3C 0001A               MOVZWL   58(AP), R0                            ; 2184
                  2C    AC                50    C0 0001E               ADDL2    R0, 44(AP)                            ;
                                          05    11 00022               BRB      3$
                  2C    AC          30    AC    D0 00024  2$:          MOVL     48(AP), 44(AP)                        ; 2186
                  34    AC          2C    AC    D0 00029  3$:          MOVL     44(AP), 52(AP)                        ; 2188
                        50                01    D0 0002E               MOVL     #1, R0                                ; 2190
                                                04 00031               RET                                            ; 2192

; Routine Size:  50 bytes,    Routine Base:  _FOR$CODE + 053A


; 2149          2193  1 !<BLF/PAGE>
```

```
1 %SBTTL 'SYNTAX_ERROR - Signal syntax error'
1 ROUTINE SYNTAX_ERROR =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       LIB$TPARSE action routine which signals a syntax error.
1 !
1 ! CALLING SEQUENCE:
1 !
1 !       status = SYNTAX_ERROR ()
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       AP      Points to PARAM_BLOCK
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! COMPLETION STATUS:
1 !
1 !       NONE
1 !
1 ! SIDE EFFECTS:
1 !
1 !       Signals FOR$_SYNERRNAM - Syntax error in NAMELIST
1 !
1 !--
1
2     BEGIN
2
2     BUILTIN
2         AP;                 ! Argument pointer points to parameter block
2
2     MAP
2         AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
2
2     IF .AP [TPA$L_TOKENCNT] LSS 6
2     THEN
3         BEGIN
3         LOCAL
3             EXTRA,
3             CCB: REF $FOR$CCB_DECL;
3         CCB = .AP [NML$A_CCB];
3
3         !+
3         ! Try to make the string reported include the part of the record
3         ! where the error was.
3         !-
3
3         IF .AP [TPA$L_TOKENPTR] GEQA .CCB [LUB$A_BUF_PTR]
3         THEN
```

```
; 2208          2251  4                 BEGIN
; 2209          2252  4                 EXTRA = MAX (0, (6 - .AP [TPA$L_TOKENCNT]));
; 2210          2253  4                 IF .AP [TPA$L_TOKENPTR] - .EXTRA LSSA .CCB [LUB$A_BUF_PTR]
; 2211          2254  4                 THEN
; 2212          2255  4                     EXTRA = .AP [TPA$L_TOKENPTR] - .CCB [LUB$A_BUF_PTR];
; 2213          2256  4                 AP [TPA$L_TOKENCNT] = .AP [TPA$L_TOKENCNT] + .EXTRA;
; 2214          2257  4                 AP [TPA$L_TOKENPTR] = .AP [TPA$L_TOKENPTR] - .EXTRA;
; 2215          2258  3                 END;
; 2216          2259  2             END;
; 2217          2260  2
; 2218          2261  2         FOR$$SIGNAL_STO (FOR$K_SYNERRNAM, AP [TPA$L_TOKENCNT]);
; 2219          2262  2         RETURN 0;
; 2220          2263  2
; 2221          2264  1         END;



                                              0004 00000 SYNTAX_ERROR:
                                                                .WORD   Save R2                                    ; 2195
                       06       10    AC  D1 00002              CMPL    16(AP), #6                                 ; 2236
                                      30  18 00006              BGEQ    3$                                         ;
                       51       40    AC  D0 00008              MOVL    64(AP), CCB                                ; 2242
               B0      A1       14    AC  D1 0000C              CMPL    20(AP), -80(CCB)                           ; 2249
                                      25  1F 00011              BLSSU   3$                                         ;
       50              06       10    AC  C3 00013              SUBL3   16(AP), #6, R0                             ; 2252
                                      02  18 00018              BGEQ    1$                                         ;
                                      50  D4 0001A              CLRL    R0                                         ;
                       52             50  D0 0001C 1$:          MOVL    R0, EXTRA                                  ;
       50              14       AC    52  C3 0001F              SUBL3   EXTRA, 20(AP), R0                          ; 2253
               B0      A1             50  D1 00024              CMPL    R0, -80(CCB)                               ;
                                      06  1E 00028              BGEQU   2$                                         ;
       52              14       AC B0 A1  C3 0002A              SUBL3   -80(CCB), 20(AP), EXTRA                    ; 2255
                       10       AC    52  C0 00030 2$:          ADDL2   EXTRA, 16(AP)                              ; 2256
                       14       AC    52  C2 00034              SUBL2   EXTRA, 20(AP)                              ; 2257
                                10    AC  9F 00038 3$:          PUSHAB  16(AP)                                     ; 2261
                                      11  DD 0003B              PUSHL   #17                                        ;
          00000000G    00             02  FB 0003D              CALLS   #2, FOR$$SIGNAL_STO                        ;
                                      50  D4 00044              CLRL    R0                                         ; 2262
                                          04 00046              RET                                                ; 2264

; Routine Size:  71 bytes,    Routine Base:  _FOR$CODE + 056C


; 2222          2265  1 !<BLF/PAGE>
```

```
%SBTTL 'INVREFVAR_ERROR - Signal invalid variable reference error'
ROUTINE INVREFVAR_ERROR =

!++
! FUNCTIONAL DESCRIPTION:
!
!       LIB$TPARSE action routine which signals an invalid variable
!       reference  error.
!
! CALLING SEQUENCE:
!
!       status = INVREFVAR_ERROR ()
!
! FORMAL PARAMETERS:
!
!       NONE
!
! IMPLICIT INPUTS:
!
!       AP      Points to PARAM_BLOCK
!
! IMPLICIT OUTPUTS:
!
!       NONE
!
! COMPLETION STATUS:
!
!       NONE
!
! SIDE EFFECTS:
!
!       Signals FOR$_INVREFVAR - Invalid reference to variable in NAMELIST
!
!--

    BEGIN

    BUILTIN
        AP;                 ! Argument pointer points to parameter block

    MAP
        AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);

    LOCAL
        DESCR: VECTOR [2, LONG],
        VARNAME: REF VECTOR [, BYTE];

    VARNAME = .AP [NML$A_VARNAME];
    DESCR [0] = .VARNAME [0];
    DESCR [1] = VARNAME [1];
    FOR$$SIGNAL_STO (FOR$K_INVREFVAR, DESCR);
    RETURN 0;

    END;
```

```
                                          0000 00000 INVREFVAR_ERROR:
                                                           .WORD    Save nothing                                 ; 2267
                   5E               04  C2 00002           SUBL2    #4, SP                                       ;
                   50         28    AC  D0 00005           MOVL     40(AP), VARNAME                              ; 2313
                   7E               60  9A 00009           MOVZBL   (VARNAME), DESCR                             ; 2314
          04       AE         01    A0  9E 0000C           MOVAB    1(R0), DESCR+4                               ; 2315
                                    5E  DD 00011           PUSHL    SP                                           ; 2316
                                    13  DD 00013           PUSHL    #19                                          ;
      00000000G    00               02  FB 00015           CALLS    #2, FOR$$SIGNAL_STO                          ;
                                    50  D4 0001C           CLRL     R0                                           ; 2317
                                        04 0001E           RET                                                   ; 2319

; Routine Size:  31 bytes,    Routine Base:  _FOR$CODE + 05B3


; 2278          2320  1 !<BLF/PAGE>
```

```
1 %SBTTL 'INPCONERR_ERROR - Signal input conversion error'
1 ROUTINE INPCONERR_ERROR =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       Routine which signals FOR$_INPCONERR, "input conversion error",
1 !       with a chained message giving the text and record number.  Although
1 !       called as if it were a LIB$TPARSE action routine, in fact it is
1 !       only called from other action routines.
1 !
1 ! CALLING SEQUENCE:
1 !
1 !       status = INPCONERR_ERROR ()
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       AP      Points to PARAM_BLOCK
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! COMPLETION STATUS:
1 !
1 !       NONE
1 !
1 ! SIDE EFFECTS:
1 !
1 !       Signals FOR$_INPCONERR, input conversion error
1 !
1 !--
1
2   BEGIN
2
2   BUILTIN
2       AP;                 ! Argument pointer points to parameter block
2
2   MAP
2       AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
2
2   LOCAL
2       CCB: REF $FOR$CCB_DECL;
2
2   CCB = .AP [NML$A_CCB];      ! Get CCB address
2
2   !+
2   ! If the file is indexed organization or is an internal file (unlikely,
2   ! since that's not allowed), then use the message that doesn't have
2   ! a record number.  Otherwise chain the message with both text and
2   ! record number.  Signal it as a continuable error.
2   !-
2
```

```
; 2337           2378  2     IF (.CCB [LUB$B_ORGAN] EQL LUB$K_ORG_INDEX) OR
; 2338           2379  3        (.CCB [LUB$W_LUN] EQL LUB$K_LUN_ENCD)
; 2339           2380  2     THEN
; 2340           2381  2        FOR$$SIGNAL (FOR$K_INPCONERR, FOR$_INVTEX, 1, AP [TPA$L_TOKENCNT])
; 2341           2382  2     ELSE
; 2342           2383  2        FOR$$SIGNAL (FOR$K_INPCONERR, FOR$_INVTEXREC, 2,
; 2343           2384  2            AP [TPA$L_TOKENCNT], .CCB [LUB$L_LOG_RECNO] - 1);
; 2344           2385  2     RETURN 0;
; 2345           2386  2
; 2346           2387  1     END;



                                                001C 00000 INPCONERR_ERROR:
                                                                   .WORD    Save R2,R3,R4                                  ; 2322
                          54 00000000G   00   9E 00002             MOVAB    FOR$$SIGNAL, R4                                ; 2369
                          52        40   AC   D0 00009             MOVL     64(AP), CCB                                    ; 2381
                          53        10   AC   9E 0000D             MOVAB    16(AP), R3                                     ;
                          03        C4   A2   91 00011             CMPB     -60(CCB), #3                                   ; 2378
                                         08   13 00015             BEQL     1$                                             ;
                    FFFB  8F        C6   A2   B1 00017             CMPW     -58(CCB), #-5                                  ; 2379
                                         13   12 0001D             BNEQ     2$                                             ;
                                         53   DD 0001F 1$:         PUSHL    R3                                             ; 2381
                                         01   DD 00021             PUSHL    #1                                             ;
                             0018883C    8F   DD 00023             PUSHL    #1607740                                       ;
                          7E        40   8F   9A 00029             MOVZBL   #64, -(SP)                                     ;
                          64             04   FB 0002D             CALLS    #4, FOR$$SIGNAL                                ;
                                         16   11 00030             BRB      3$                                             ;
             7E       E0  A2             01   C3 00032 2$:         SUBL3    #1, -32(CCB), -(SP)                            ; 2384
                                         53   DD 00037             PUSHL    R3                                             ;
                                         02   DD 00039             PUSHL    #2                                             ;
                             00188834    8F   DD 0003B             PUSHL    #1607732                                       ;
                          7E        40   8F   9A 00041             MOVZBL   #64, -(SP)                                     ;
                          64             05   FB 00045             CALLS    #5, FOR$$SIGNAL                                ;
                                         50   D4 00048 3$:         CLRL     R0                                             ; 2385
                                              04 0004A             RET                                                     ; 2387

; Routine Size:  75 bytes,    Routine Base:  _FOR$CODE + 05D2


; 2347           2388  1 !<BLF/PAGE>
; 2349          2389  1 %SBTTL 'BLANKS_OFF - Turn off explicit blanks'
; 2350          2390  1 ROUTINE BLANKS_OFF =
; 2351          2391  1
; 2352          2392  1 !++
; 2353          2393  1 ! FUNCTIONAL DESCRIPTION:
; 2354          2394  1 !
; 2355          2395  1 !       Turns off explicit blank processing for LIB$TPARSE.  When off, blanks
; 2356          2396  1 !       are implicit separators.
; 2357          2397  1 !
; 2358          2398  1 ! CALLING SEQUENCE:
; 2359          2399  1 !
; 2360          2400  1 !       status = BLANKS_OFF ()
; 2361          2401  1 !
; 2362          2402  1 ! FORMAL PARAMETERS:
; 2363          2403  1 !
; 2364          2404  1 !       NONE
; 2365          2405  1 !
; 2366          2406  1 ! IMPLICIT INPUTS:
; 2367          2407  1 !
; 2368          2408  1 !       AP      Points to PARAM_BLOCK
; 2369          2409  1 !
; 2370          2410  1 ! IMPLICIT OUTPUTS:
; 2371          2411  1 !
; 2372          2412  1 !       PARAM_BLOCK [TPA$V_BLANKS] = 0
; 2373          2413  1 !
; 2374          2414  1 ! COMPLETION STATUS:
; 2375          2415  1 !
; 2376          2416  1 !       1 for success
; 2377          2417  1 !
; 2378          2418  1 ! SIDE EFFECTS:
; 2379          2419  1 !
; 2380          2420  1 !       NONE
; 2381          2421  1 !
; 2382          2422  1 !--
; 2383          2423  1
; 2384          2424  2     BEGIN
; 2385          2425  2
; 2386          2426  2     BUILTIN
; 2387          2427  2         AP;                 ! Argument pointer points to parameter block
; 2388          2428  2
; 2389          2429  2     MAP
; 2390          2430  2         AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
; 2391          2431  2
; 2392          2432  2     AP [TPA$V_BLANKS] = 0;         ! Turn off blank processing
; 2393          2433  2     RETURN 1;
; 2394          2434  2
; 2395          2435  1     END;



                                              0000 00000 BLANKS_OFF:
                                                                   .WORD   Save nothing                                     ; 2390
                     04   AC             01  8A 00002              BICB2   #1, 4(AP)                                        ; 2432
                          50             01  D0 00006              MOVL    #1, R0                                           ; 2433
                                             04 00009              RET                                                      ; 2435
```

```
; Routine Size:  10 bytes,    Routine Base:  _FOR$CODE + 061D

; 2396         2436  1 !<BLF/PAGE>
; 2398          2437  1 %SBTTL 'BLANKS_ON - Turn on explicit blanks'
; 2399          2438  1 ROUTINE BLANKS_ON =
; 2400          2439  1
; 2401          2440  1 !++
; 2402          2441  1 ! FUNCTIONAL DESCRIPTION:
; 2403          2442  1 !
; 2404          2443  1 !       Turns on explicit blank processing for LIB$TPARSE.  When on, blanks
; 2405          2444  1 !       are not implicit separators.
; 2406          2445  1 !
; 2407          2446  1 ! CALLING SEQUENCE:
; 2408          2447  1 !
; 2409          2448  1 !       status = BLANKS_ON ()
; 2410          2449  1 !
; 2411          2450  1 ! FORMAL PARAMETERS:
; 2412          2451  1 !
; 2413          2452  1 !       NONE
; 2414          2453  1 !
; 2415          2454  1 ! IMPLICIT INPUTS:
; 2416          2455  1 !
; 2417          2456  1 !       AP      Points to PARAM_BLOCK
; 2418          2457  1 !
; 2419          2458  1 ! IMPLICIT OUTPUTS:
; 2420          2459  1 !
; 2421          2460  1 !       PARAM_BLOCK [TPA$V_BLANKS] = 0
; 2422          2461  1 !
; 2423          2462  1 ! COMPLETION STATUS:
; 2424          2463  1 !
; 2425          2464  1 !       1 for success
; 2426          2465  1 !
; 2427          2466  1 ! SIDE EFFECTS:
; 2428          2467  1 !
; 2429          2468  1 !       NONE
; 2430          2469  1 !
; 2431          2470  1 !--
; 2432          2471  1
; 2433          2472  2     BEGIN
; 2434          2473  2
; 2435          2474  2     BUILTIN
; 2436          2475  2         AP;                 ! Argument pointer points to parameter block
; 2437          2476  2
; 2438          2477  2     MAP
; 2439          2478  2         AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
; 2440          2479  2
; 2441          2480  2     AP [TPA$V_BLANKS] = 1;          ! Turn on blank processing
; 2442          2481  2     RETURN 1;
; 2443          2482  2
; 2444          2483  1     END;



                                        0000 00000 BLANKS_ON:
                                                             .WORD   Save nothing                                       ; 2438
                         04   AC          01  88 00002        BISB2   #1, 4(AP)                                          ; 2480
                              50          01  D0 00006        MOVL    #1, R0                                             ; 2481
                                              04 00009        RET                                                        ; 2483
```

```
; Routine Size:  10 bytes,    Routine Base:  _FOR$CODE + 0627

; 2445          2484  1 !<BLF/PAGE>
```

```
1 %SBTTL 'LOOKUP_IDENTIFIER - Lookup identifier in NAMELIST group'
1 ROUTINE LOOKUP_IDENTIFIER =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       Searches the NAMELIST group for an identifier which matches the
1 !       current token.  If found, the descriptor information is entered into
1 !       the parameter block.  If not found, an error is signalled.
1 !
1 ! CALLING SEQUENCE:
1 !
1 !       status = LOOKUP_IDENTIFIER ()
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       AP      Points to PARAM_BLOCK
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       PARAM_BLOCK [NML$A_VARNAME] = address of variable name counted string
1 !       PARAM_BLOCK [NML$A_VARSTART] = address of variable low byte
1 !       PARAM_BLOCK [NML$A_VAREND] = address of next byte past end of variable
1 !       PARAM_BLOCK [NML$A_VARCUR] = same as VARSTART
1 !       PARAM_BLOCK [NML$W_VARSIZE] = size of a variable element in bytes
1 !       PARAM_BLOCK [NML$W_STRIDE] = stride between elements if array, else 0
1 !       PARAM_BLOCK [NML$B_DTYPE] = descriptor datatype code of variable
1 !       PARAM_BLOCK [NML$B_CONSTYPE] = 0
1 !       PARAM_BLOCK [NML$L_REPEATCT] = 1
1 !       PARAM_BLOCK [NML$V_IMAG] = 0
1 !       PARAM_BLOCK [NML$V_VALUE_IDENT] = 0
1 !       PARAM_BLOCK [NML$V_SUBSTRING] = 0;
1 !       PARAM_BLOCK [NML$V_SUBSCRIPT] = 0;
1 !
1 ! COMPLETION STATUS:
1 !
1 !       1 for success
1 !
1 ! SIDE EFFECTS:
1 !
1 !       Signals FOR$_INVREFVAR - Invalid NAMELIST variable if identifier is not in
1 !       the current group.
1 !
1 !--
1
2     BEGIN
2
2     BUILTIN
2       AP;                     ! Argument pointer points to parameter block
2
2     MAP
2       AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
2
```

```
LOCAL
    NML_LIST: REF VECTOR [, LONG];              ! Pointer to list descriptor

NML_LIST = .AP [NML$A_LISTBLOCK];               ! Get list block address

!+
! Loop through identifier list looking for a matching identifier.  If none
! found, signal an error.  Loop value will be true if no match found.
!-

IF (
    DECRU I FROM .(NML_LIST [1])<0,16,0> TO 1 DO      ! Count is first word of second longword
        BEGIN
        NML_LIST = NML_LIST [2];                ! Move to next identifier in list
        IF COMPARE_UPCASE (.NML_LIST[0], AP [TPA$L_TOKENCNT])
        THEN
            EXITLOOP 0;     ! Loop value false if a match is found
        END)
THEN
    BEGIN
    !+
    ! If we get here, there is no match.  Signal an error giving the variable
    ! name.
    !-

    FOR$$SIGNAL_STO (FOR$K_INVREFVAR, AP [TPA$L_TOKENCNT]);

    RETURN 0;           ! Execution should never return here
    END

ELSE

    BEGIN

    !+
    ! A match has been found.  Fill in the parameter block from the
    ! descriptor.
    !-

    LOCAL
        DESC: REF BLOCK [, BYTE];    ! Variable descriptor

    AP [NML$A_VARNAME] = .NML_LIST [0];        ! Address of name counted string
    DESC = .NML_LIST [1];              ! Descriptor address

    !+
    ! Validate descriptor class and datatype
    ! \\ Note:  The use of the ONE_OF macro here assumes that
    !      neither a datatype code of 0 nor a class code
    !      of 0 is one of the valid ones.  If this
    !      is no longer true, the value must first be tested to
    !      ensure that it is not greater than 127 (unsigned). \\
    !-

    IF NOT ONE_OF (.DESC [DSC$B_DTYPE],
        DSC$K_DTYPE_BU, DSC$K_DTYPE_B , DSC$K_DTYPE_WU,
        DSC$K_DTYPE_W , DSC$K_DTYPE_LU, DSC$K_DTYPE_L ,
                DSC$K_DTYPE_T , DSC$K_DTYPE_F , DSC$K_DTYPE_D ,
                DSC$K_DTYPE_G , DSC$K_DTYPE_H , DSC$K_DTYPE_FC,
                DSC$K_DTYPE_DC, DSC$K_DTYPE_GC) OR
            NOT ONE_OF (.DESC [DSC$B_CLASS],
                DSC$K_CLASS_S, DSC$K_CLASS_A)
        THEN
            BEGIN
            FOR$$SIGNAL_STO (FOR$K_INVARGFOR);
            RETURN 0;
            END;

        !+
        ! Fill in parameter block.
        !-

        AP [NML$A_VARSTART] = .DESC [DSC$A_POINTER];
        AP [NML$A_VARCUR] = .DESC [DSC$A_POINTER];
        AP [NML$W_VARSIZE] = .DESC [DSC$W_LENGTH];
        AP [NML$B_DTYPE] = .DESC [DSC$B_DTYPE];
        AP [NML$A_DESCR] = .DESC;

        IF .DESC [DSC$B_CLASS] EQL DSC$K_CLASS_A
        THEN
            BEGIN
            !+
            ! If the array descriptor doesn't have COLUMN order and
            ! coefficient and bounds blocks, or if it has
            ! more than 7 dimensions, then the descriptor is
            ! invalid for us.
            !-

            IF NOT (.DESC [DSC$V_FL_COLUMN] AND
                    .DESC [DSC$V_FL_COEFF] AND
                    .DESC [DSC$V_FL_BOUNDS] AND
                    (.DESC [DSC$B_DIMCT] LEQU 7))
            THEN
                BEGIN
                FOR$$SIGNAL_STO (FOR$K_INVARGFOR);
                RETURN 0;
                END;

            AP [NML$A_VAREND] = .AP [NML$A_VARSTART] + .DESC [DSC$L_ARSIZE];
            AP [NML$W_STRIDE] = .AP [NML$W_VARSIZE];
            END
        ELSE
            BEGIN
            AP [NML$A_VAREND] = .AP [NML$A_VARSTART] + .AP [NML$W_VARSIZE];
            AP [NML$W_STRIDE] = 0;
            END;

        AP [NML$B_CONSTYPE] = 0;
        AP [NML$L_REPEATCT] = 1;
        AP [NML$V_IMAG] = 0;
        AP [NML$V_VALUE_IDENT] = 0;
        AP [NML$V_SUBSCRIPT] = 0;
        AP [NML$V_SUBSTRING] = 0;
```

```
; 2618          2656  3             !+
; 2619          2657  3             ! Since FORTRAN insists on passing us datatype BU for a signed byte,
; 2620          2658  3             ! change it here.
; 2621          2659  3             !-
; 2622          2660  3
; 2623          2661  3             IF .AP [NML$B_DTYPE] EQL DSC$K_DTYPE_BU
; 2624          2662  3             THEN
; 2625          2663  3                 AP [NML$B_DTYPE] = DSC$K_DTYPE_B;
; 2626          2664  2             END;
; 2627          2665  2
; 2628          2666  2         RETURN 1;     ! Success
; 2629          2667  2
; 2630          2668  1         END;



                                      01FC 00000 LOOKUP_IDENTIFIER:
                                                         .WORD   Save R2,R3,R4,R5,R6,R7,R8                ; 2486
                   58 00000000G  00  9E 00002            MOVAB   FOR$$SIGNAL_STO, R8                      ;
                   56          24  AC  D0 00009          MOVL    36(AP), NML_LIST                         ; 2545
                   55          10  AC  9E 0000D          MOVAB   16(AP), R5                               ; 2556
                   57          04  A6  3C 00011          MOVZWL  4(NML_LIST), I                           ;
                                   0E  11 00015          BRB     2$                                       ;
                   56              08  C0 00017 1$:      ADDL2   #8, NML_LIST                             ; 2555
                   54              66  D0 0001A          MOVL    (NML_LIST), R4                           ; 2556
                                0000V  30 0001D          BSBW    COMPARE_UPCASE                           ;
                   0D              50  E8 00020          BLBS    R0, 3$                                   ;
                                   57  D7 00023          DECL    I                                        ; 2553
                                   F0  12 00025 2$:      BNEQ    1$                                       ;
                                   55  DD 00027          PUSHL   R5                                       ; 2567
                                   13  DD 00029          PUSHL   #19                                      ;
                   68              02  FB 0002B          CALLS   #2, FOR$$SIGNAL_STO                      ;
                                   56  11 0002E          BRB     6$                                       ; 2569
              28   AC              66  D0 00030 3$:      MOVL    (NML_LIST), 40(AP)                       ; 2584
                   52          04  A6  D0 00034          MOVL    4(NML_LIST), DESC                        ; 2585
         50 3BBE001C   8F      02  A2  78 00038          ASHL    2(DESC), #1002307612, R0                 ; 2601
                                   3E  18 00041          BGEQ    5$                                       ;
                   01          03  A2  91 00043          CMPB    3(DESC), #1                              ; 2603
                                   06  13 00047          BEQL    4$                                       ;
                   04          03  A2  91 00049          CMPB    3(DESC), #4                              ;
                                   32  12 0004D          BNEQ    5$                                       ;
              2C   AC          04  A2  D0 0004F 4$:      MOVL    4(DESC), 44(AP)                          ; 2614
              34   AC          04  A2  D0 00054          MOVL    4(DESC), 52(AP)                          ; 2615
              38   AC              62  B0 00059          MOVW    (DESC), 56(AP)                           ; 2616
              44   AC          02  A2  90 0005D          MOVB    2(DESC), 68(AP)                          ; 2617
              3C   AC              52  D0 00062          MOVL    DESC, 60(AP)                             ; 2618
                   04          03  A2  91 00066          CMPB    3(DESC), #4                              ; 2620
                                   2A  12 0006A          BNEQ    8$                                       ;
         10        0A  A2          05  E1 0006C          BBC     #5, 10(DESC), 5$                         ; 2630
         0B        0A  A2          06  E1 00071          BBC     #6, 10(DESC), 5$                         ; 2631
                               0A  A2  95 00076          TSTB    10(DESC)                                 ; 2632
                                   06  18 00079          BGEQ    5$                                       ;
                   07          0B  A2  91 0007B          CMPB    11(DESC), #7                             ; 2633
                                   07  1B 0007F          BLEQU   7$                                       ;
                                   30  DD 00081 5$:      PUSHL   #48                                      ; 2636
```

```
                           68             01  FB 00083          CALLS   #1, FOR$$SIGNAL_STO                           ;
                                          34  11 00086 6$:      BRB     11$                                            ; 2637
          30   AC     2C   AC       0C    A2  C1 00088 7$:      ADDL3   12(DESC), 44(AP), 48(AP)                       ; 2640
                      3A   AC       38    AC  B0 0008F          MOVW    56(AP), 58(AP)                                 ; 2641
                                          0D  11 00094          BRB     9$                                             ; 2620
                           50       38    AC  3C 00096 8$:      MOVZWL  56(AP), R0                                     ; 2645
                      30   AC       2C  BC40  9E 0009A          MOVAB   @44(AP)[R0], 48(AP)                            ;
                                    3A    AC  B4 000A0          CLRW    58(AP)                                         ; 2646
                                    46    AC  94 000A3 9$:      CLRB    70(AP)                                         ; 2649
                      78   AC             01  D0 000A6          MOVL    #1, 120(AP)                                    ; 2650
                      45   AC             0F  8A 000AA          BICB2   #15, 69(AP)                                    ; 2654
                      02            44    AC  91 000AE          CMPB    68(AP), #2                                     ; 2661
                                          04  12 000B2          BNEQ    10$                                            ;
                      44   AC             06  90 000B4          MOVB    #6, 68(AP)                                     ; 2663
                           50             01  D0 000B8 10$:     MOVL    #1, R0                                         ; 2666
                                              04 000BB          RET                                                    ;
                                          50  D4 000BC 11$:     CLRL    R0                                             ; 2668
                                              04 000BE          RET                                                    ;

; Routine Size:  191 bytes,    Routine Base:  _FOR$CODE + 0631


; 2631          2669  1 !<BLF/PAGE>
; 2633          2670  1 %SBTTL 'SET_VALUE_IDENT - Mark that last token is supposed to be an identifier'
; 2634          2671  1 ROUTINE SET_VALUE_IDENT =
; 2635          2672  1
; 2636          2673  1 !++
; 2637          2674  1 ! FUNCTIONAL DESCRIPTION:
; 2638          2675  1 !
; 2639          2676  1 !       LIB$TPARSE action routine which is called when the character following
; 2640          2677  1 !       a value token indicates that the last token is supposed to be an
; 2641          2678  1 !       identifier.  It sets a flag in the parameter block which is checked
; 2642          2679  1 !       when the next identifier is needed.
; 2643          2680  1 !
; 2644          2681  1 ! CALLING SEQUENCE:
; 2645          2682  1 !
; 2646          2683  1 !       status = SET_VALUE_IDENT ()
; 2647          2684  1 !
; 2648          2685  1 ! FORMAL PARAMETERS:
; 2649          2686  1 !
; 2650          2687  1 !       NONE
; 2651          2688  1 !
; 2652          2689  1 ! IMPLICIT INPUTS:
; 2653          2690  1 !
; 2654          2691  1 !       AP      Points to PARAM_BLOCK
; 2655          2692  1 !
; 2656          2693  1 ! IMPLICIT OUTPUTS:
; 2657          2694  1 !
; 2658          2695  1 !       NML$V_VALUE_IDENT = 1
; 2659          2696  1 !
; 2660          2697  1 ! COMPLETION STATUS:
; 2661          2698  1 !
; 2662          2699  1 !       1
; 2663          2700  1 !
; 2664          2701  1 ! SIDE EFFECTS:
; 2665          2702  1 !
; 2666          2703  1 !       NONE
; 2667          2704  1 !
; 2668          2705  1 !--
; 2669          2706  1
; 2670          2707  2     BEGIN
; 2671          2708  2
; 2672          2709  2     BUILTIN
; 2673          2710  2         AP;             ! Argument pointer points to parameter block
; 2674          2711  2
; 2675          2712  2     MAP
; 2676          2713  2         AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
; 2677          2714  2
; 2678          2715  2     AP [NML$V_VALUE_IDENT] = 1;
; 2679          2716  2     RETURN 1;
; 2680          2717  2
; 2681          2718  1     END;


                                         0000 00000 SET_VALUE_IDENT:
                                                          .WORD   Save nothing                                  ; 2671
                  45   AC           04   88 00002         BISB2   #4, 69(AP)                                    ; 2715
```

```
                                        50            01  D0 00006          MOVL    #1, R0                                          ; 2716
                                                          04 00009          RET                                                     ; 2718

; Routine Size:  10 bytes,    Routine Base:  _FOR$CODE + 06F0


; 2682          2719  1 !<BLF/PAGE>
```

```
%SBTTL 'WAS_VALUE_IDENT - Lookup last value as an identifier'
ROUTINE WAS_VALUE_IDENT =

!++
! FUNCTIONAL DESCRIPTION:
!
!       LIB$TPARSE action routine which is called when an identifier is needed.
!       If NML$V_VALUE_IDENT is 1 then the last value token is supposed to be
!       an identifier. Otherwise, 0 is returned.  The last value token, if it
!       could possibly be an identifier, was stored in NML$T_TOKEN.  We call
!       LOOKUP_IDENTIFIER to see if it is.  If the last token wasn't of type
!       REAL or LOGICAL or if the token length is zero, we fail.
!
! CALLING SEQUENCE:
!
!       status = WAS_VALUE_IDENT ()
!
! FORMAL PARAMETERS:
!
!       NONE
!
! IMPLICIT INPUTS:
!
!       AP      Points to PARAM_BLOCK
!       NML$V_VALUE_IDENT
!       NML$T_TOKEN
!
! IMPLICIT OUTPUTS:
!
!       See LOOKUP_IDENTIFIER
!
! COMPLETION STATUS:
!
!       1 if LOOKUP_IDENTIFIER succeeds
!       0 if last token isn't an identifier
!
! SIDE EFFECTS:
!
!       See LOOKUP_IDENTIFIER
!
!--

    BEGIN

    BUILTIN
        AP;                 ! Argument pointer points to parameter block

    MAP
        AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);

    LOCAL
        TOKEN: REF VECTOR [, BYTE];

    !+
    ! If NML$V_VALUE_IDENT is 0, then fail.
    !-

```

```
; 2741          2777  2        IF NOT .AP [NML$V_VALUE_IDENT]
; 2742          2778  2        THEN
; 2743          2779  2            RETURN 0;
; 2744          2780  2
; 2745          2781  2        !+
; 2746          2782  2        ! If last constant type is not REAL or LOGICAL or INTEGER or if token length
; 2747          2783  2        ! is zero, then we have a syntax error.
; 2748          2784  2        !-
; 2749          2785  2
; 2750          2786  2        IF NOT ONE_OF (.AP [NML$B_CONSTYPE], K_REAL, K_LOGICAL, K_INTEGER) OR
; 2751          2787  2            .AP [NML$T_TOKEN] EQL 0
; 2752          2788  2        THEN
; 2753          2789  3            BEGIN
; 2754          2790  3            !+
; 2755          2791  3            ! We reached this state by matching TPA$_LAMBDA just at the delimiter
; 2756          2792  3            ! that caused us to think that the last value token was really an
; 2757          2793  3            ! identifier.  TOKENPTR points to that delimiter and TOKENCNT is 0.
; 2758          2794  3            ! Increment TOKENCNT so that the delimiter will be in the error
; 2759          2795  3            ! message.
; 2760          2796  3            !-
; 2761          2797  3
; 2762          2798  3            AP [TPA$L_TOKENCNT] = .AP [TPA$L_TOKENCNT] + 1;
; 2763          2799  3            CALLG (.AP, SYNTAX_ERROR);
; 2764          2800  2            END;
; 2765          2801  2
; 2766          2802  2
; 2767          2803  2        !+
; 2768          2804  2        ! Construct token from NML$T_TOKEN.
; 2769          2805  2        !-
; 2770          2806  2
; 2771          2807  2        TOKEN = AP [NML$T_TOKEN];
; 2772          2808  2        AP [TPA$L_TOKENCNT] = .TOKEN [0];
; 2773          2809  2        AP [TPA$L_TOKENPTR] = TOKEN [1];
; 2774          2810  2        RETURN CALLG (.AP, LOOKUP_IDENTIFIER);
; 2775          2811  2
; 2776          2812  1        END;



                                                    0000 00000 WAS_VALUE_IDENT:
                                                                     .WORD   Save nothing                          ; 2721
                   2B        45    AC            02   E1 00002       BBC     #2, 69(AP), 3$                        ; 2777
                   50 70000000    8F       46    AC   78 00007       ASHL    70(AP), #1879048192, R0               ; 2786
                                                 05   18 00010       BGEQ    1$                                    ;
                                           7C    AC   95 00012       TSTB    124(AP)                               ; 2787
                                                 08   12 00015       BNEQ    2$                                    ;
                                           10    AC   D6 00017 1$:   INCL    16(AP)                                ; 2798
                            FE53   CF             6C   FA 0001A       CALLG   (AP), SYNTAX_ERROR                    ; 2799
                              50           7C    AC   9E 0001F 2$:   MOVAB   124(AP), TOKEN                        ; 2807
                              10   AC             60   9A 00023       MOVZBL  (TOKEN), 16(AP)                       ; 2808
                              14   AC       01    A0   9E 00027       MOVAB   1(R0), 20(AP)                         ; 2809
                            FF06   CF             6C   FA 0002C       CALLG   (AP), LOOKUP_IDENTIFIER               ; 2810
                                                 04   00031           RET                                           ;
                                           50    D4   00032 3$:       CLRL    R0                                    ; 2812
                                                 04   00034           RET                                           ;
```

```
; Routine Size:  53 bytes,    Routine Base:  _FOR$CODE + 06FA

; 2777          2813  1 !<BLF/PAGE>
```

```
1 %SBTTL 'COMPARE_UPCASE - Compare strings upcased'
1 ROUTINE COMPARE_UPCASE (
1                             CSTRING_ADR,
1                             STRING2_DSC
1                             ) : JSB_COMPARE_UPCASE =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       Compare two strings: the counted string whose address is CSTRING_ADR
1 !       and the string described by the descriptor STRING2_DSC.  The
1 !       STRING2_DSC string is upcased for the comparison; the CSTRING_ADR
1 !       string is assumed to be already upcased.
1 !
1 !       Comparison continues until a non-matching character is found or until
1 !       one of the strings is empty.  No blank-filling is done.
1 !
1 ! CALLING SEQUENCE:
1 !
1 !       matches = COMPARE_UPCASE (CSTRING_ADR, STRING2_DSC)
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       CSTRING_ADR     - The address of a counted string whose count is in the
1 !                         first byte.  Assumed to be uppercase.
1 !
1 !       STRING2_DSC     - The address of a string descriptor.  This string will
1 !                         be forced to upper case during the comparison.  The
1 !                         string itself is not modified.
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! FUNCTION VALUE:
1 !
1 !       1 if the strings are equal
1 !       0 otherwise
1 !
1 ! SIDE EFFECTS:
1 !
1 !       NONE
1 !
1 !--
1
2     BEGIN
2
2     MAP
2       CSTRING_ADR: REF VECTOR [, BYTE],
2       STRING2_DSC: REF BLOCK [, BYTE];
2
2     LOCAL
2       STRING2_ADR: REF VECTOR [, BYTE],
; 2836          2871  2          STRING1_LEN: WORD;
; 2837          2872  2
; 2838          2873  2      !+
; 2839          2874  2      ! Compare string lengths.  If they don't match, return failure.
; 2840          2875  2      !-
; 2841          2876  2
; 2842          2877  2      STRING1_LEN = .CSTRING_ADR [0];
; 2843          2878  2      IF .STRING1_LEN NEQU .STRING2_DSC [DSC$W_LENGTH]
; 2844          2879  2      THEN
; 2845          2880  2          RETURN 0;
; 2846          2881  2
; 2847          2882  2      !+
; 2848          2883  2      ! Compare strings for equality.  Lengths must match.
; 2849          2884  2      !-
; 2850          2885  2
; 2851          2886  2      STRING2_ADR = .STRING2_DSC [DSC$A_POINTER];
; 2852          2887  2      INCRU I FROM 1 TO .STRING1_LEN DO
; 2853          2888  3          BEGIN
; 2854          2889  3          IF .CSTRING_ADR [.I] NEQU
; 2855          2890  4              (
; 2856          2891  4              IF .STRING2_ADR [0] GEQU %C'a' AND .STRING2_ADR [0] LEQU %C'z'
; 2857          2892  4              THEN
; 2858          2893  5                  CH$RCHAR_A (STRING2_ADR) - (%C'a' - %C'A')
; 2859          2894  4              ELSE
; 2860          2895  4                  CH$RCHAR_A (STRING2_ADR)
; 2861          2896  4              )
; 2862          2897  3          THEN
; 2863          2898  3              RETURN 0;    ! Unequal character found
; 2864          2899  2          END;
; 2865          2900  2
; 2866          2901  2      !+
; 2867          2902  2      ! If we get here, then the match is successful.
; 2868          2903  2      !-
; 2869          2904  2
; 2870          2905  2      RETURN 1;
; 2871          2906  2
; 2872          2907  1      END;



                     50              64  9B 00000 COMPARE_UPCASE:
                                                               MOVZBW   (CSTRING_ADR), STRING1_LEN                          ; 2877
                     53              50  3C 00003              MOVZWL   STRING1_LEN, R3                                     ; 2878
                     53              65  B1 00006              CMPW     (STRING2_DSC), R3                                   ;
                                     33  12 00009              BNEQ     5$                                                  ;
                     51        04    A5  D0 0000B              MOVL     4(STRING2_DSC), STRING2_ADR                         ; 2886
                     52              01  D0 0000F              MOVL     #1, I                                               ; 2887
                                     21  11 00012              BRB      4$                                                  ;
                61   8F              61  91 00014 1$:          CMPB     (STRING2_ADR), #97                                  ; 2891
                                     0E  1F 00018              BLSSU    2$                                                  ;
                7A   8F              61  91 0001A              CMPB     (STRING2_ADR), #122                                 ;
                                     08  1A 0001E              BGTRU    2$                                                  ;
                     50              81  9A 00020              MOVZBL   (STRING2_ADR)+, R0                                  ; 2893
                     50              20  C2 00023              SUBL2    #32, R0                                             ;
                                     03  11 00026              BRB      3$                                                  ;
```

```
                              50          81  9A 00028 2$:      MOVZBL  (STRING2_ADR)+, R0                              ; 2895
         50         6244      08          00  ED 0002B 3$:      CMPZV   #0, #8, (I)[CSTRING_ADR], R0                    ; 2890
                                          0B  12 00031          BNEQ    5$                                              ;
                                          52  D6 00033          INCL    I                                               ; 2887
                              53          52  D1 00035 4$:      CMPL    I, R3                                           ;
                                          DA  1B 00038          BLEQU   1$                                              ;
                              50          01  D0 0003A          MOVL    #1, R0                                          ; 2905
                                              05 0003D          RSB                                                     ;
                                          50  D4 0003E 5$:      CLRL    R0                                              ; 2907
                                              05 00040          RSB                                                     ;

; Routine Size:  65 bytes,    Routine Base:  _FOR$CODE + 072F
```

```
1 %SBTTL 'DUMP_NAMES - Respond to "?" inquiry'
1 ROUTINE DUMP_NAMES =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       LIB$TPARSE action routine which is called when '?' is seen
1 !       in place of a variable.  If this file is a terminal on which we
1 !       have PUT access, call FOR$$DO_NML_OUTPUT to dump the group name
1 !       and variable names in the current namelist group.
1 !
1 ! CALLING SEQUENCE:
1 !
1 !       status = DUMP_NAMES ()
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       AP      Points to PARAM_BLOCK
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! COMPLETION STATUS:
1 !
1 !       1
1 !
1 ! SIDE EFFECTS:
1 !
1 !       May list namelist group on terminal.
1 !
1 !--
1
2     BEGIN
2
2     BUILTIN
2         AP;                   ! Argument pointer points to parameter block
2
2     MAP
2         AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
2
2     GLOBAL REGISTER
2         CCB = 11: REF $FOR$CCB_DECL;
2
2     CCB = .AP [NML$A_CCB];          ! Load CCB register
2
2     !+
2     ! If we are on a terminal with PUT access, list the namelist group.
2     !-
2
3         BEGIN
3         BIND
3             FAB = CCB: REF $FOR$FAB_CCB_STRUCT,
; 2931          2965  3                 FAB_DEV = FAB [FAB$L_DEV]: BLOCK [4, BYTE];
; 2932          2966  3
; 2933          2967  3             IF .FAB_DEV [DEV$V_TRM] AND .FAB [FAB$V_PUT]
; 2934          2968  3             THEN
; 2935          2969  4                 BEGIN
; 2936          2970  4                 FOR$$REC_WSNO ();    ! Start output record
; 2937          2971  4                 FOR$$DO_NML_OUTPUT (1);      ! Dump names only
; 2938          2972  3                 END;
; 2939          2973  2             END;
; 2940          2974  2
; 2941          2975  2         RETURN 1;
; 2942          2976  2
; 2943          2977  1         END;



                                          083C 00000 DUMP_NAMES:
                                                              .WORD   Save R2,R3,R4,R5,R11                 ; 2909
                      5B        40  AC  D0 00002              MOVL    64(AP), CCB                          ; 2956
                      50      0084  CB  9E 00006              MOVAB   132(R11), R0                         ; 2965
              13      60            02  E1 0000B              BBC     #2, (R0), 1$                         ; 2967
                      0F        5A  AB  E9 0000F              BLBC    90(FAB), 1$                          ;
                         00000000G  00  16 00013              JSB     FOR$$REC_WSNO                        ; 2970
                                    01  DD 00019              PUSHL   #1                                   ; 2971
           00000000G  00            01  FB 0001B              CALLS   #1, FOR$$DO_NML_OUTPUT               ;
                      50            01  D0 00022 1$:          MOVL    #1, R0                               ; 2975
                                        04 00025              RET                                          ; 2977

; Routine Size:  38 bytes,    Routine Base:  _FOR$CODE + 0770
```

```
1 %SBTTL 'DUMP_VALUES - Respond to "=?" inquiry'
1 ROUTINE DUMP_VALUES =
1
1 !++
1 ! FUNCTIONAL DESCRIPTION:
1 !
1 !       LIB$TPARSE action routine which is called when '=?' is seen
1 !       in place of a variable.  If this file is a terminal on which we
1 !       have PUT access, call FOR$$DO_NML_OUTPUT to dump the group name
1 !       and variable names and values in the current namelist group.
1 !
1 ! CALLING SEQUENCE:
1 !
1 !       status = DUMP_VALUES ()
1 !
1 ! FORMAL PARAMETERS:
1 !
1 !       NONE
1 !
1 ! IMPLICIT INPUTS:
1 !
1 !       AP      Points to PARAM_BLOCK
1 !
1 ! IMPLICIT OUTPUTS:
1 !
1 !       NONE
1 !
1 ! COMPLETION STATUS:
1 !
1 !       1
1 !
1 ! SIDE EFFECTS:
1 !
1 !       May list namelist group on terminal.
1 !
1 !--
1
2     BEGIN
2
2     BUILTIN
2         AP;                 ! Argument pointer points to parameter block
2
2     MAP
2         AP: REF BLOCK [, BYTE] FIELD (NML$FIELDS);
2
2     GLOBAL REGISTER
2         CCB = 11: REF $FOR$CCB_DECL;
2
2     CCB = .AP [NML$A_CCB];          ! Load CCB register
2
2     !+
2     ! If we are on a terminal with PUT access, list the namelist group.
2     !-
2
3         BEGIN
3         BIND
3             FAB = CCB: REF $FOR$FAB_CCB_STRUCT,
; 3002          3035  3             FAB_DEV = FAB [FAB$L_DEV]: BLOCK [4, BYTE];
; 3003          3036  3
; 3004          3037  3         IF .FAB_DEV [DEV$V_TRM] AND .FAB [FAB$V_PUT]
; 3005          3038  3         THEN
; 3006          3039  4             BEGIN
; 3007          3040  4             FOR$$REC_WSNO ();   ! Start output record
; 3008          3041  4             FOR$$DO_NML_OUTPUT (0);      ! Dump names and values
; 3009          3042  3             END;
; 3010          3043  2         END;
; 3011          3044  2
; 3012          3045  2     RETURN 1;
; 3013          3046  2
; 3014          3047  1     END;




                                             083C 00000 DUMP_VALUES:
                                                              .WORD   Save R2,R3,R4,R5,R11                          ; 2979
                             5B        40    AC  D0 00002     MOVL    64(AP), CCB                                   ; 3026
                             50      0084    CB  9E 00006     MOVAB   132(R11), R0                                  ; 3035
                   13        60              02  E1 0000B     BBC     #2, (R0), 1$                                  ; 3037
                             0F        5A    AB  E9 0000F     BLBC    90(FAB), 1$
                                00000000G    00  16 00013     JSB     FOR$$REC_WSNO                                 ; 3040
                                             7E  D4 00019     CLRL    -(SP)                                         ; 3041
                   00000000G 00              01  FB 0001B     CALLS   #1, FOR$$DO_NML_OUTPUT
                             50              01  D0 00022 1$: MOVL    #1, R0                                        ; 3045
                                                 04 00025     RET                                                   ; 3047

; Routine Size:  38 bytes,    Routine Base:  _FOR$CODE + 0796
; 3016          3048  1 END                                              ! End of module FOR$$NML_TABLES
; 3017          3049  1
; 3018          3050  0 ELUDOM



;                                 PSECT SUMMARY
;
;       Name                     Bytes                        Attributes
;
;   _LIB$KEY0$                        0  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,  PIC,ALIGN(1)
;   _LIB$STATE$                    1050  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,  PIC,ALIGN(1)
;   _FOR$CODE                      1980  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,  PIC,ALIGN(2)



;                            Library Statistics
;
;                                          -------- Symbols --------      Pages       Processing
;       File                               Total    Loaded   Percent      Mapped      Time
;
;   _$255$DUA28:[SYSLIB]STARLET.L32;1        9776        37         0        581        00:01.1
;   _$255$DUA28:[FORRTL.OBJ]FORLIB.L32;1      711       216        30         52        00:00.5
;   _$255$DUA28:[FORRTL.OBJ]RTLLIB.L32;1       36         0         0          8        00:00.1
;   _$255$DUA28:[SYSLIB]TPAMAC.L32;1           42        27        64         14        00:00.1



;                                  COMMAND QUALIFIERS
;
;       BLISS/CHECK=(FIELD,INITIAL,OPTIMIZE)/NOTRACE/LIS=LIS$:FORNMLTAB/OBJ=OBJ$:FORNMLTAB MSRC$:FORNMLTAB/UPDATE=(ENH$:FORNMLTAB
;       )

; Size:          1980 code + 1050 data bytes
; Run Time:         01:58.7
; Elapsed Time:     04:10.6
; Lines/CPU Min:     1541
; Lexemes/CPU-Min: 73012
; Memory Used:  417 pages
; Compilation Complete
```

0181 AH-BT13A-SE
VAX/VMS V4.0

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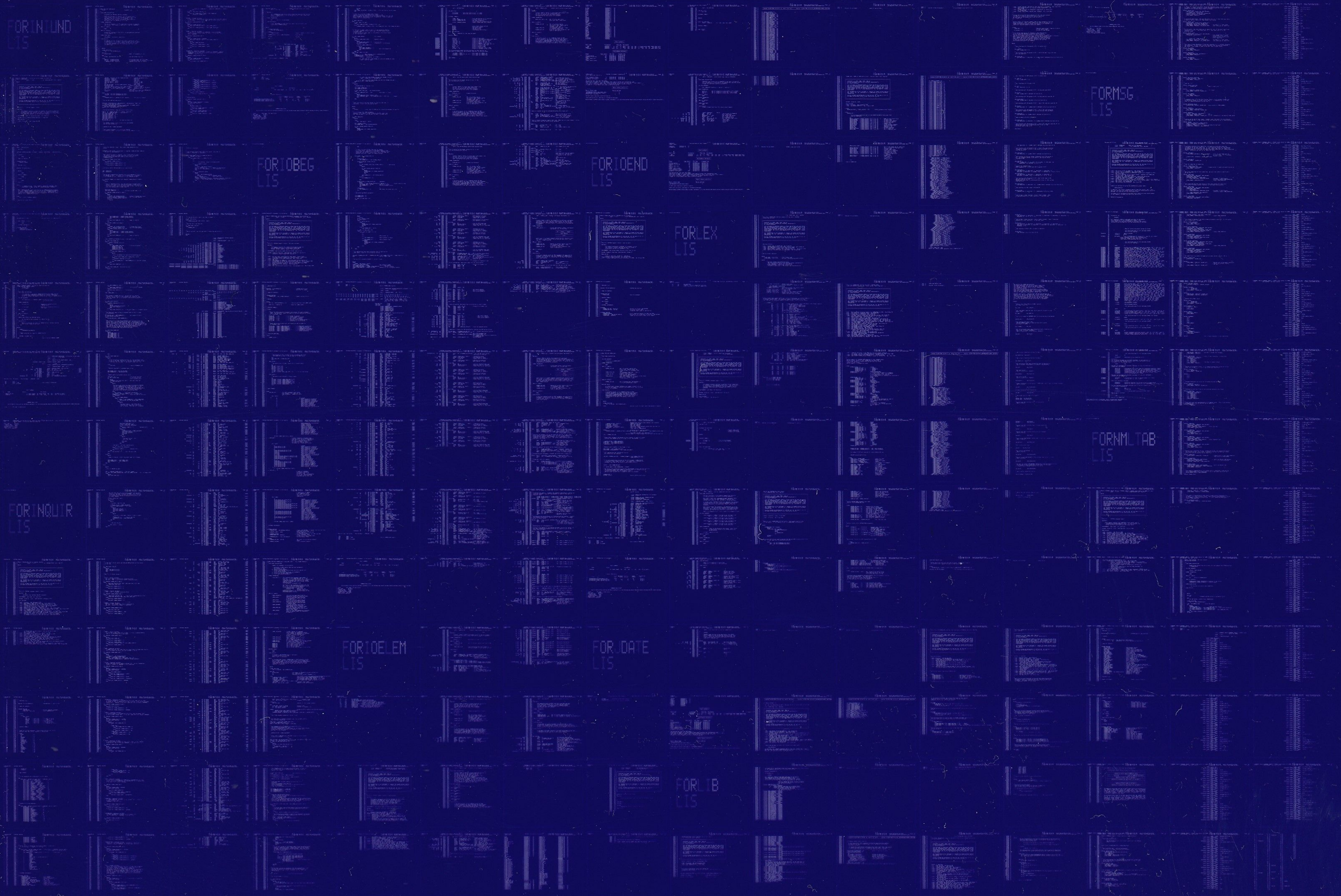

0182 AH-BT13A-SE
VAX/VMS V4.0

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FORRAB
LIS

FORREADDF
LIS

FOROPNKEY
LIS

FORPAUSE
LIS

FORRANDOM
LIS

FOROPEN
LIS

FOROPENDE
LIS

FORREADDO
LIS